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Cisco Nexus 5000 Series Hardware Installation Guide

November 2008

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You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

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Preface

This preface describes the audience, organization, and conventions of the *Cisco Nexus 5000 Series Hardware Installation Guide*. It also provides information on how to obtain related documentation.

Audience

To use this installation guide, you must be familiar with electronic circuitry and wiring practices and preferably be an electronic or electromechanical technician.

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	Product Overview	Provides an overview of the Cisco Nexus 5000 switches and their components.
Chapter 2	Installing the Cisco Nexus 5000 Switch	Describes how to install the Cisco Nexus 5000 switches, and how to install modules, power supplies, and fan assemblies.
Chapter 3	Connecting the Cisco Nexus 5000 Switch	Describes how to connect the Cisco Nexus 5000 switches, including the modules.
Appendix A	Cabinet and Rack Installation	Provides guidelines for selecting an enclosed cabinet, the procedure for installing a switch using the optional and EIA Shelf Bracket Kit.
Appendix B	Technical Specifications	Lists specifications for the Cisco Nexus 5000 switches and components including modules, power supplies, and transceivers.
Appendix C	Cable and Port Specifications	Lists cable and port specifications for the Cisco Nexus 5000 switches.

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Chapter	Title	Description
Appendix D	Site Planning and Maintenance Records	Provides site planning and maintenance records.
Appendix E	Troubleshooting Hardware Components	Provides installation troubleshooting information for the Cisco Nexus 5000 switches.

Conventions

This document uses the following conventions for notes, cautions, and safety warnings.

Notes and Cautions contain important information that you should be aware of.



Note

Means *reader take note*. Notes contain helpful suggestions or references to material that are not covered in the publication.



Caution

Means *reader be careful*. You are capable of doing something that might result in equipment damage or loss of data.

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, can cause physical injuries. A warning symbol precedes each warning statement.



Warning

IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Waarschuwing

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

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Varoitus TÄRKEITÄ TURVALLISUUSOHJEITA

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET

Attention IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza IMPORTANTI ISTRUZIONI SULLA SICUREZZA

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI

Advarsel VIKTIGE SIKKERHETSINSTRUKSJONER

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

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Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES

¡Advertencia! INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES

Varning! VIKTIGA SÄKERHETSANVISNINGAR

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR

Figyelem FONTOS BIZTONSÁGI ELOÍRÁSOK

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejte helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!

Предупреждение ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

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警告 重要的安全性说明

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

警告 安全上の重要な注意事項

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

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이 지시 사항을 보관하십시오.

Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES

Advarsel VIGTIGE SIKKERHEDSANVISNINGER

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemeskade. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER

تحذير

إرشادات الأمان الهامة

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في آخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز. قم بحفظ هذه الإرشادات

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Upozorenje VAŽNE SIGURNOSNE NAPOMENE

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznat sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE

Upozornění DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY

Προειδοποίηση ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθειες πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

אזהרה

הוראות בטיחות חשובות

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כדי לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

Opomena VAŽNI BEZBEDNOSNI NAPATSTVIJA

Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.

ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА

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Ostrzeżenie WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

Opozorilo POMEMBNI VARNOSTNI NAPOTKI

Ta opozorilni simbol pomeni nevarnost. Nahajate se v situaciji, kjer lahko pride do telesnih poškodb. Preden pričnete z delom na napravi, se morate zavedati nevarnosti udara električnega toka, ter tudi poznati preventivne ukrepe za preprečevanje takšnih nevarnosti. Uporabite obrazložitevno številko na koncu posameznega opozorila, da najdete opis nevarnosti v priloženem varnostnem priročniku.

SHRANITE TE NAPOTKE!

警告

重要安全性指示

此警告符號代表危險，表示可能造成人身傷害。使用任何設備前，請留心電路相關危險，並熟悉避免意外的標準作法。您可以使用每項警告後的聲明編號，查詢本裝置隨附之安全性警告譯文中的翻譯。請妥善保留此指示

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Related Documentation

The documentation set for the Cisco Nexus 5000 Series includes the following documents:

- *Cisco Nexus 5000 Series Release Notes for NX-OS Releases*
- *Cisco Nexus 5000 Series Fabric Manager Configuration Guide*
- *Cisco Nexus 5000 Series Fabric Manager Online Help*
- *Cisco Nexus 5000 Series CLI Configuration Guide*
- *Cisco Nexus 5000 Series Command Reference*
- *Cisco Nexus 5000 Series MIB Quick Reference*
- *Cisco Nexus 5000 Series System Messages Guide*
- *Cisco Nexus 5000 Series Troubleshooting Guide*
- *Cisco Nexus 5000 Series XML Management Interface Guide*
- *Cisco Nexus 5000 Series Hardware Installation Guide*
- *Regulatory Compliance and Safety Information for the Cisco Nexus 5000 Series*

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New* in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>



CHAPTER 1

Product Overview

This chapter describes the Nexus 5000 series switches and contains these sections:

- [Nexus 5020 Switch, page 1-1](#)
- [Nexus 5010 Switch, page 1-15](#)

Nexus 5020 Switch

This section describes the Cisco Nexus 5020 switch and its components. This section includes the following topics:

- [Features, page 1-1](#)
- [Chassis, page 1-2](#)
- [Ports, page 1-8](#)
- [Expansion Modules, page 1-5](#)
- [Power Supply, page 1-9](#)
- [Fan Module, page 1-10](#)
- [LED Descriptions, page 1-12](#)
- [Supported SFP Transceivers, page 1-14](#)

Features

The Cisco Nexus 5020 switch is a 2 RU, top-of-rack switch that provides Ethernet and Fibre Channel consolidation in a single physical cable. The Fibre Channel over Ethernet (FCoE) protocol is used to consolidate Ethernet and Fibre Channel traffic onto the same physical connection between the server and the switch. As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5020 switch, and it connects to the LAN or SAN.

The Cisco Nexus 5020 switch is a part of a family of switches that provide 10-Gigabit Ethernet and FCoE ports and both 10-Gigabit Ethernet and native 1-, 2-, and 4-Gbps Fibre Channel ports. The switches provide consolidated I/O connectivity to both production Ethernet LANs and Fibre Channel SANs in a cost-effective, high-performance, low-latency Ethernet switch.

The Cisco Nexus 5020 switch has the following features:

- Forty fixed 10-Gigabit Ethernet server connection ports on the back of the switch

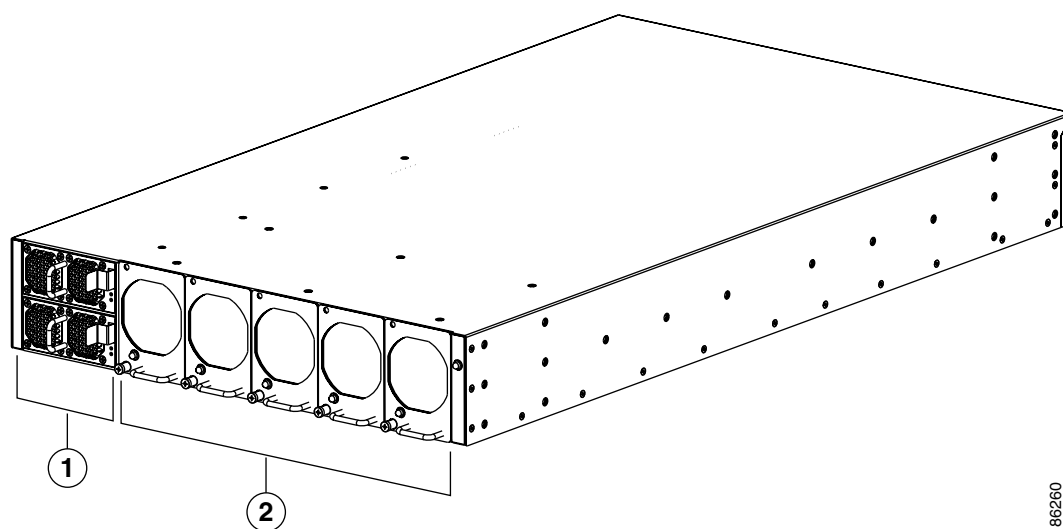
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- Two slots for optional 10-Gigabit expansion modules or Fibre Channel interfaces on the back of the switch
- Two slots on the front of the switch for hot swap-capable power supplies
- Five slots on the front of the switch for hot swap-capable fan modules, each of which houses two fans, that provide front-to-back cooling for the switch

Chassis

The Cisco Nexus 5020 chassis is 2 RU (3.47 inches) tall, 17.3 inches wide, and 30.0 inches deep. It is designed to be mounted in a standard 19-inch rack. The switch has two power supplies and five fan modules on the front of the switch. Ports are at the rear of the switch. The airflow is front to back. [Figure 1-1](#) shows the front of the Cisco Nexus 5020 switch.

Figure 1-1 Cisco Nexus 5020 Switch Front View

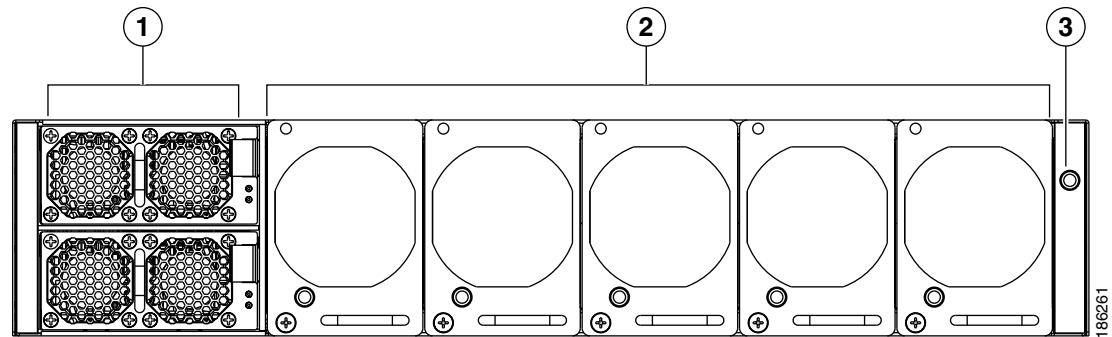


1	Two power supplies	2	Five fan modules
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[Figure 1-2](#) shows a close-up view of the front of the switch.

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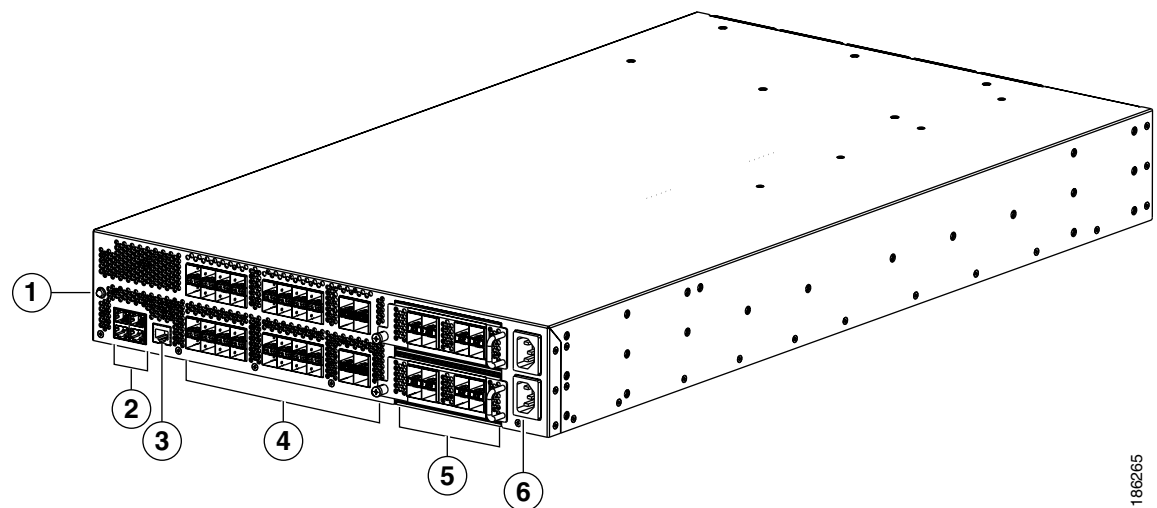
Figure 1-2 Cisco Nexus 5020 Switch Front View Close-up



1	Two power supplies	3	System status LED
2	Five fan modules		

The rear of the Cisco Nexus 5020 chassis has 40 fixed 10-Gigabit Ethernet ports, 2 slots for optional expansion modules, an Ethernet connector with 2 cross-connect ports and 2 management ports, a console port, and 2 AC power connectors. [Figure 1-3](#) shows the rear of the Cisco Nexus 5020 switch.

Figure 1-3 Cisco Nexus 5020 Switch Rear View

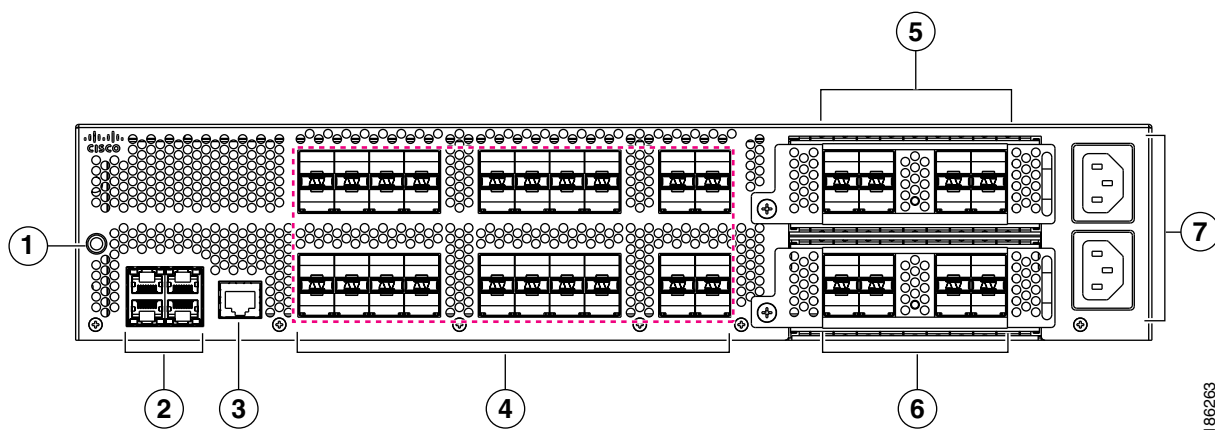


1	System status LED	4	40 fixed 10-Gigabit Ethernet ports
2	Ethernet connector with two cross-connect ports on the left (top and bottom), and two network management ports on the right (top and bottom)	5	Expansion modules, shown here with two 4-port Fibre Channel plus 4-port 10-Gigabit Ethernet expansion modules
3	Console port	6	AC power connectors

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Figure 1-4 shows a close-up view of the rear of the Cisco Nexus 5020 chassis.

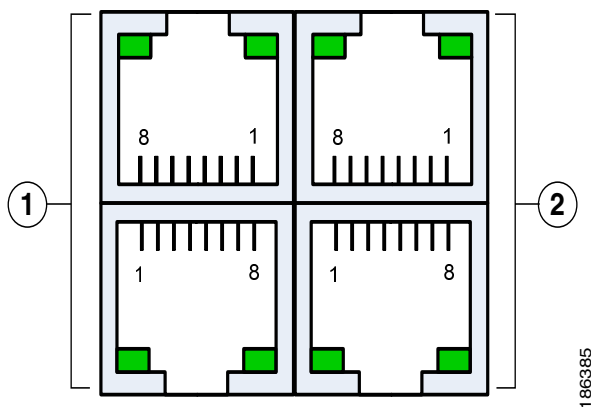
Figure 1-4 Cisco Nexus 5020 Switch Rear View Close-up



1	System status LED	4	Slot 1, with 40 fixed 10-Gigabit Ethernet ports (highlighted in red).
2	Ethernet connector with two cross-connect ports on left side, and two network management1 (top) and management2 (bottom) ports on the right side	5	Slot 2 for an optional expansion module; shown here with a 4-port Fibre Channel plus 4-port 10-Gigabit Ethernet expansion module
3	Console port	6	Slot 3 for an optional expansion module; shown here with a 4-port Fibre Channel plus 4-port 10-Gigabit Ethernet expansion module

The Ethernet connector port exposes four Ethernet ports that are in a 2x2 stacked RJ-45 jack. Figure 1-5 shows a close-up view of the Ethernet connector port.

Figure 1-5 Ethernet Connector Port



1	Internal cross connect ports	2	Network management ports
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Table 1-1 lists the LED descriptions for all Ethernet LEDs.

Table 1-1 Ethernet LED Descriptions

LED	Status	Description
Left	Off	No link
	Solid green	Physical link
Right	Off	No activity
	Blinking green	Activity

Expansion Modules

Expansion modules allow Cisco Nexus 5000 switches to be configured as cost-effective 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity. The Cisco Nexus 5020 switch has two slots that can be used for the following optional expansion modules:

- Fibre Channel plus Ethernet expansion module with four 10-Gigabit Ethernet Cisco Data Center Ethernet and FCoE ports and four 1-, 2-, and 4-Gbps Fibre Channel ports
- Ethernet expansion module with six ports of 10-Gigabit Ethernet Cisco Data Center Ethernet and FCoE

The chassis supports hot swapping of the expansion modules.

Fibre Channel Plus Ethernet Expansion Module

The Fibre Channel plus Ethernet expansion module supports four SFP+ transceiver modules and four 1-, 2-, 4-Gbps Fibre Channel transceivers. The Fibre Channel plus Ethernet expansion module is a field-replaceable unit (FRU). Figure 1-6 shows the Fibre Channel plus Ethernet expansion module.

Figure 1-6 Fibre Channel Plus Ethernet Expansion Module

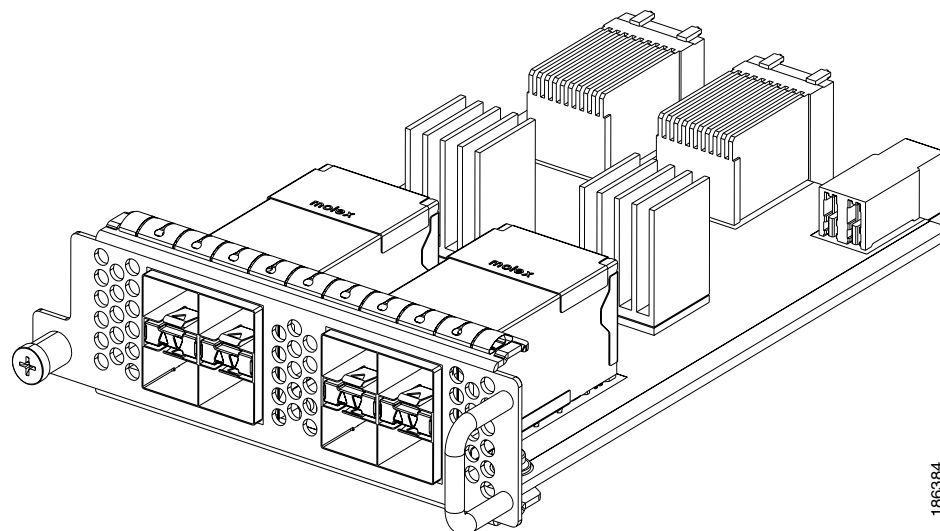
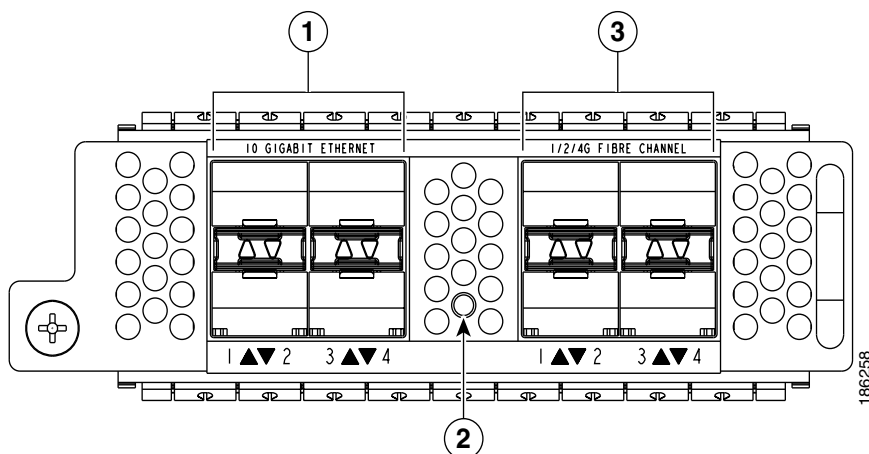


Figure 1-7 shows the front of the Fibre Channel plus Ethernet expansion module. Figure 1-11 shows how ports are numbered on the Fibre Channel plus Ethernet expansion module.

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Figure 1-7 Front of the Fibre Channel Plus Ethernet Expansion Module f



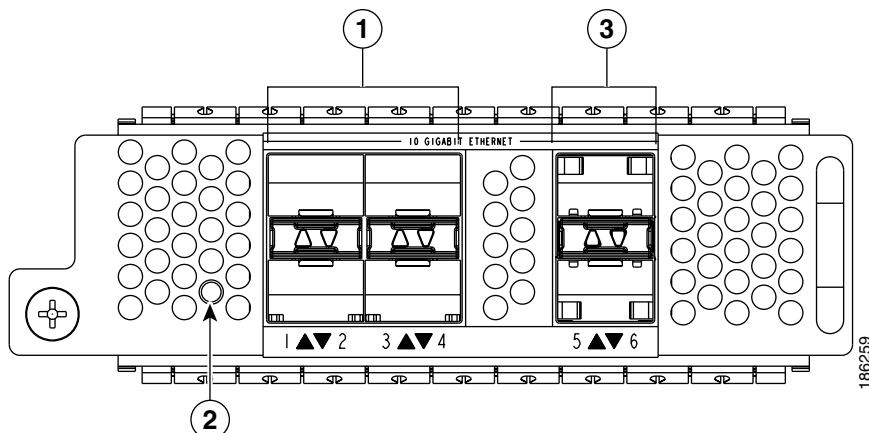
1	Four 10-Gigabit Ethernet ports	3	Four 1-, 2-, 4-Gbps Fibre Channel ports
2	Module LED		

See [Figure 1-11](#) for an illustration how ports are grouped and numbered on the Fibre Channel plus Ethernet expansion module.

Ethernet Expansion Module

The Ethernet expansion module supports six 10-Gigabit Ethernet ports, four of which will have encryption capability. The Ethernet expansion is a field-replaceable unit (FRU). [Figure 1-8](#) shows the Ethernet expansion module.

Figure 1-8 Ethernet Expansion Module



1 & 3	Six 10-Gigabit Ethernet ports	2	Module LED
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See [Figure 1-12](#) for an illustration of how ports are grouped and numbered on the Ethernet expansion module.

N5K-M1008

The N5K-M1008 GEM supports 8 1/2/4G Fiber Channel, SFP based uplink connection. [Figure 1-25](#) shows the N5K-M1008 GEM.

Figure 1-9 N5K-M1008 GEM

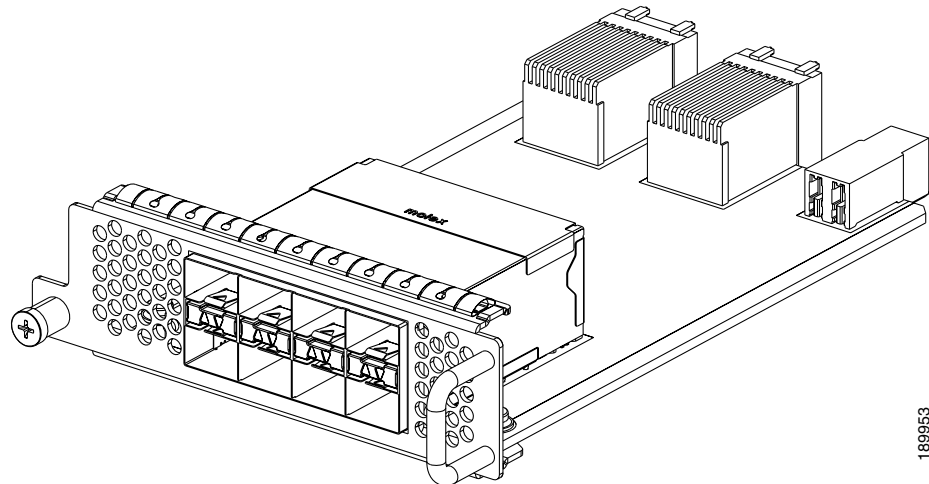
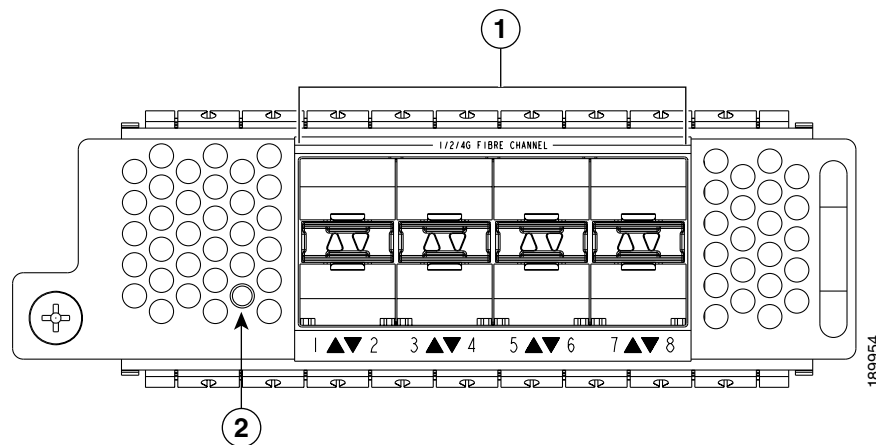


Figure 1-10 Front of the N5K-M1008 GEM



1	Eight 1-, 2-, 4-Gbps Fibre Channel ports	2	LED
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Ports

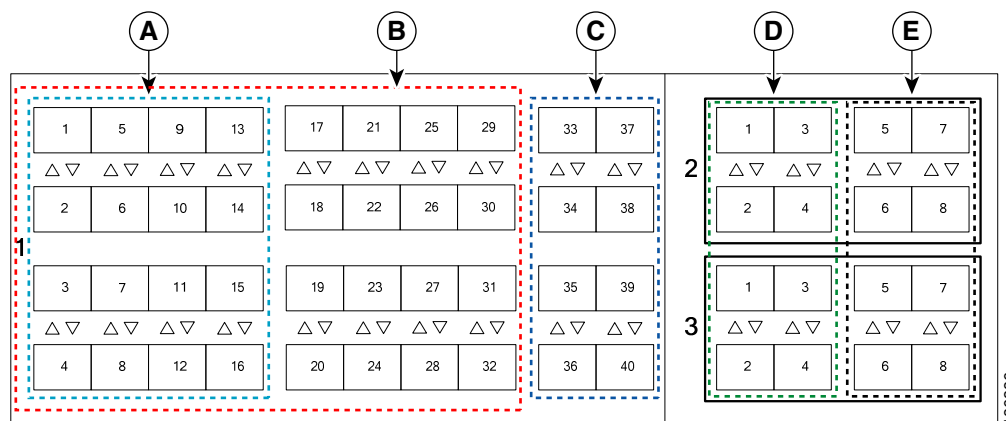
Each individual port on the Cisco Nexus 5020 switch is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right. The 40 fixed ports form group 1 and are named 1/*port_number*. Ports 1 through 32 are unencrypted Ethernet ports. Of these, ports 1 through 16 are 10-Gigabit Ethernet and 1-Gigabit Ethernet capable ports. Ports 33 through 40 are encryption-capable Ethernet ports.

Group 2 includes the ports in the top-most expansion module. Group 2 ports 1 through 4 are encrypted Ethernet ports. Group 2 ports 5 through 8 are Fibre Channel ports.

Group 3 includes the ports in the bottom-most expansion module. Group 3 ports 1 through 4 are encrypted Ethernet ports. Group 3 ports 5 through 8 are Fibre Channel ports.

Figure 1-11 shows how ports are numbered and grouped by function for both the fixed ports and the Fibre Channel plus Ethernet expansion module ports.

Figure 1-11 Port Numbering of Fixed Ports and Fibre Channel Plus Ethernet Expansion Module Ports

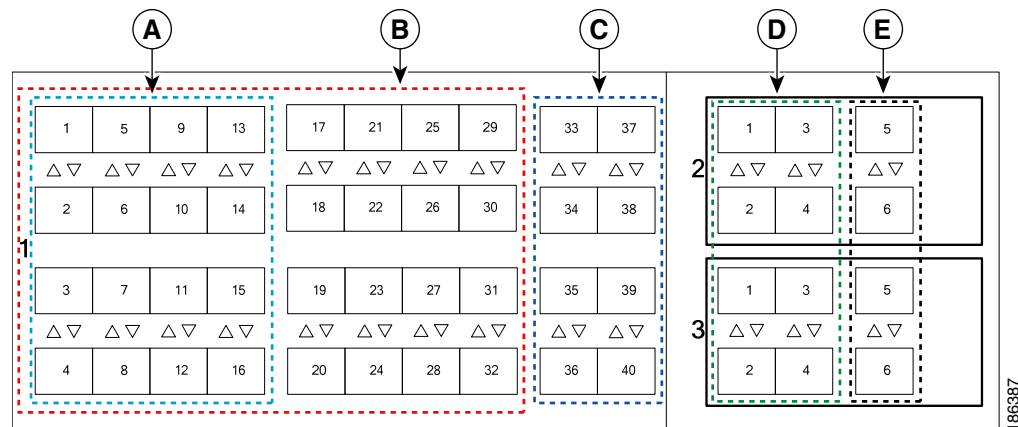


A	Group 1/ports 1 through 16: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	D	Groups 2 and 3/ ports 1 through 4: Encrypted Ethernet ports
B	Group 1/ports 1 through 32: Unencrypted Ethernet ports	E	Groups 2 and 3/ ports 5 through 8: Fibre Channel ports
C	Group 1/ports 33 through 40: Encrypted Ethernet ports		

Figure 1-12 shows how ports are numbered and grouped by function for both the fixed ports and the Ethernet expansion module ports.

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Figure 1-12 Port Numbering of Fixed Ports and the Ethernet Expansion Module

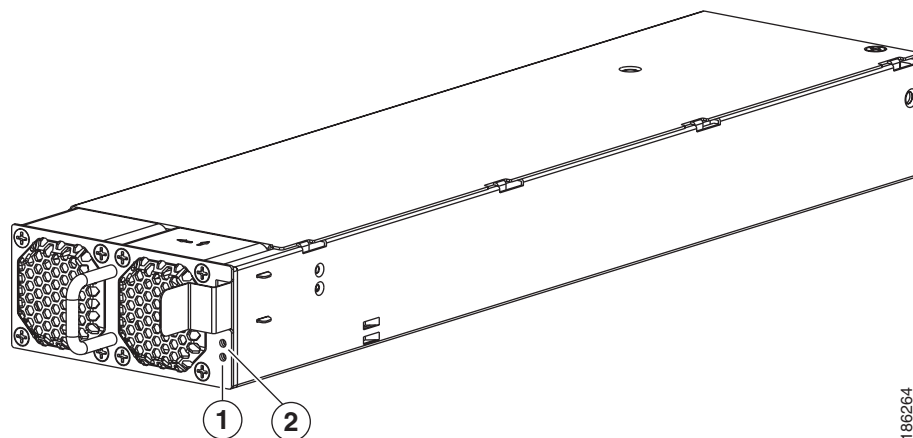


A	Group 1/ports 1 through 16: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable Encrypted ports	D	Groups 2 and 3/ ports 1 through 4: Encrypted Ethernet ports
B	Group 1/ports 1 through 32: Unencrypted Ethernet ports	E	Groups 2 and 3/ ports 5 through 6: Unencrypted Ethernet ports
C	Group 1/ports 33 through 40: Encrypted Ethernet ports		

Power Supply

The Cisco Nexus 5020 switch uses a front-end power supply. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the Cisco Nexus 5020 switch is fully functional with one power supply. [Figure 1-13](#) shows the power supply, which has two LEDs: one for power status and one for failure condition.

Figure 1-13 Power Supply for the Cisco Nexus 5020 Switch



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1	Green power LED indicates the power status.	2	Amber fail LED indicates a failure condition.
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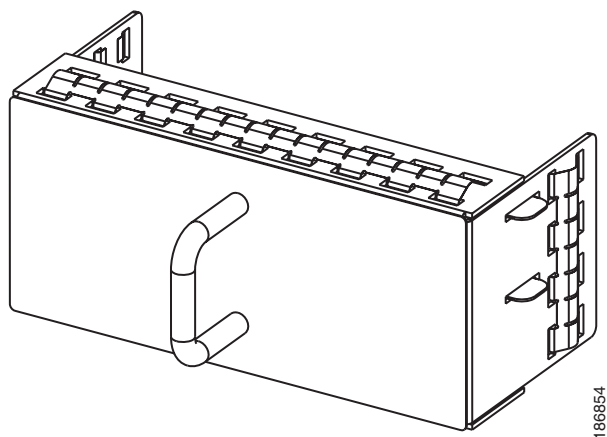
Table 1-2 table describes the status of the two power supply LEDs.

Table 1-2 Power Supply LED Descriptions

Power Supply Condition	Power LED Status	Fail LED Status
No AC power to all power supplies.	Off	Off
Power supply failure, including over voltage, over current, over temperature, and fan failure.	Off	On
Power supply warning events where the power supply continues to operate. These events include high temperature, high power, and slow fan.	Off	1 Hz Blinking
AC present, 3.3 voltage standby (VSB) on, and the power supply unit is off.	1 Hz blinking	Off
Power supply on and OK.	On	Off

If one power supply is installed in the chassis, but the other power supply slot is empty, a blank filler panel should be used to cover the empty slot. Figure 1-14 shows a blank power supply filler panel.

Figure 1-14 Blank Power Supply Filler Panel



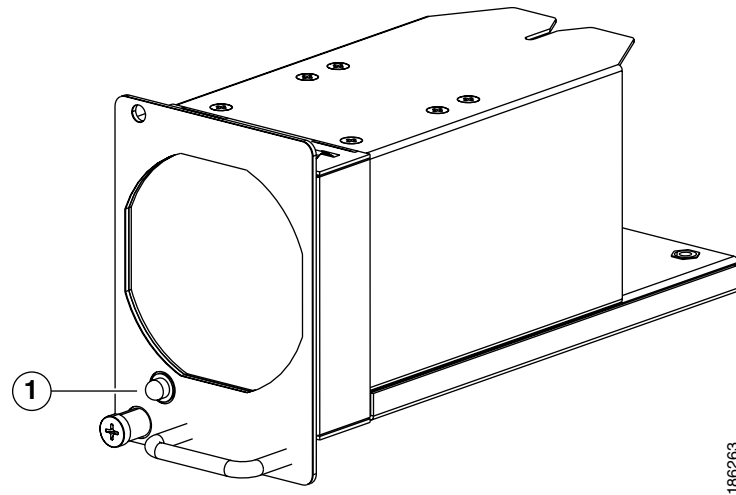
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Fan Module

The Cisco Nexus 5020 switch has five fans modules. Figure 1-15 shows the fan module.

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Figure 1-15 Cisco Nexus 5020 Fan Module



1	Fan module LED
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The bicolor fan module LED indicates fan tray health. Green indicates normal operation, while amber indicates a fan failure.

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LED Descriptions

Table 1-3 describes the LEDs for the Cisco Nexus 5020 switch.

Table 1-3 LEDs for the Cisco Nexus 5020 Switch

LED	Location	Function	Color	Status	Description
Chassis	Front and back of chassis	Chassis power and health	Green	Solid on	All diagnostics pass. The module is operational.
				Off	The module is not receiving power.
			Amber	On	The module is booting or running diagnostics. An over temperature condition has occurred. The temperature threshold has been exceeded by a small value during environmental monitoring.
				Blinking	An over temperature condition has occurred. The temperature threshold has been exceeded by a large value during environmental monitoring. If the module fails during initial reset, the LED continues to blink and the module does not come online. The module has runtime failure and is brought offline.
Fan module	Fan modules (front)	Fan module health indicator	Green	Solid on	All diagnostics pass. The module is operational.
				Off	The module is not receiving power.
			Amber	Solid on	The module is booting or running diagnostics.
			Amber	Blinking	If the module fails during initial reset, the LED continues to blink and the module does not come online. The module has runtime failure and is brought offline.

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Table 1-3 LEDs for the Cisco Nexus 5020 Switch (continued)

LED	Location	Function	Color	Status	Description
Power supply	Power supply (front)	Power supply health	Green	Solid on	Power supply is on and okay.
				Off	No AC power to the power supply.
			Amber	Solid on	Power supply failures, over voltage, over current, over temperature.
				1 Hz Blinking	AC is present, 3.3 VSB on, and the power supply is off.
				Off	Operating normally.
Module	Back of chassis	Indicator of a fault with any expansion module	Green	On	All diagnostics pass. The module is operational.
				Off	The module is not receiving power.
			Amber	Solid on	The module is booting or running diagnostics. An over temperature condition has occurred. The temperature threshold has been exceeded by a small value during environmental monitoring.
				Blinking	An over temperature condition has occurred. The temperature threshold has been exceeded by a large value during environmental monitoring. If the module fails during initial reset, the LED continues to blink and the module does not come online. The module has runtime failure and is brought offline
Port LED	Back of the chassis	Indicates LED status	Green	Off	The port is not active or the link is not connected.
				Solid on	The port is active. The link is connected and operational.
			Amber	Solid on	The module or port is disabled through the CLI command or the module is initializing.
				Blinking	The port is faulty and has been disabled.

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Supported SFP Transceivers

The Cisco Nexus 5020 switch supports both SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

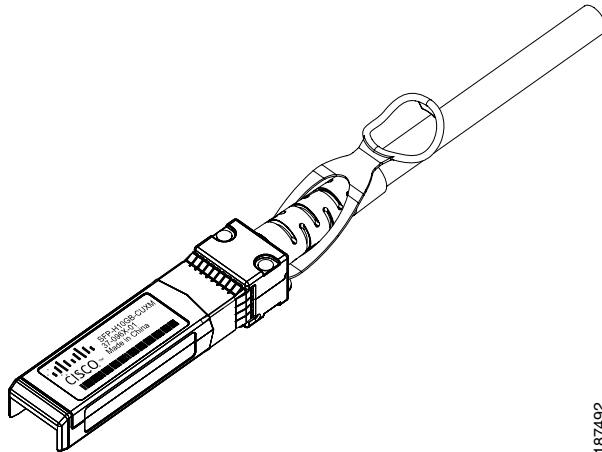
SFP+ Transceivers

The enhanced Small-Form-Factor Pluggable (SFP+) 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface. The Cisco Nexus 5020 switch supports the SFP-10G-SR transceiver.

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—short range SFP+ module

Figure 1-16 shows the SFP-10G-SR transceiver.

Figure 1-16 SFP+ 10-Gigabit Ethernet Transceiver Module



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SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. The cables come in the following lengths:

- 1m, 30AWG
- 3m, 28-30 AWG
- 5m, 26-28 AWG
- 7m, 24-26 AWG

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Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter
SFP-H10GB-CU7M	10GBASE-CU SFP+ Cable 7 Meter

SFP Fiber Channel Transceivers

The Cisco Nexus 5020 switch also supports the following SFP Fibre Channel transceiver:

Model	Description
DS-SFP-FC4G-SW	4-Gbps/2-Gbps/1-Gbps Fibre Channel—short wavelength SFP module

Nexus 5010 Switch

This section describes the Cisco Nexus 5010 switch and its components. This section includes the following topics:

- [Features, page 1-16](#)
- [Chassis, page 1-16](#)
- [Ports, page 1-23](#)
- [Expansion Modules, page 1-20](#)
- [Power Supply, page 1-25](#)
- [Fan Module, page 1-26](#)
- [LED Descriptions, page 1-27](#)
- [Supported SFP Transceivers, page 1-28](#)

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Features

The Cisco Nexus 5010 switch is a 1RU, top-of-rack switch that provides Ethernet and Fibre Channel consolidation in a single physical cable. The Fibre Channel over Ethernet (FCoE) protocol is used to consolidate Ethernet and Fibre Channel traffic onto the same physical connection between the server and the switch. As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5010 switch, and it connects to the LAN or SAN.

The Cisco Nexus 5010 switch is a part of a family of switches that provide 10-Gigabit Ethernet and FCoE ports and both 10-Gigabit Ethernet and native 1-, 2-, and 4-Gbps Fibre Channel ports. The switches provide consolidated I/O connectivity to both production Ethernet LANs and Fibre Channel SANs in a cost-effective, high-performance, low-latency Ethernet switch.

The Cisco Nexus 5010 switch has the following features:

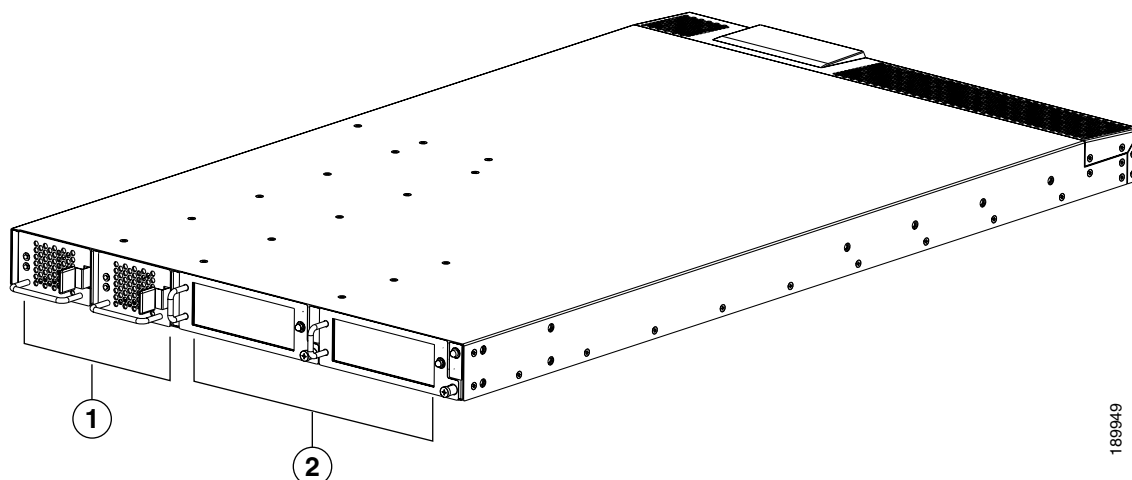
- One slot on the back of the switch for an optional uplink Gatos Expansion Module [GEM]. There are several modules which can be accommodated in this slot. Three such modules are N5K-M1404, N5K-M1600 and N5K-M1008.
- Twenty to twenty-eight ports on the back of the switch depending on which GEM is installed. This is because twenty ports on Cisco Nexus 5010 switch belong to the base switch. Additionally, one module can be inserted which can be of 6 or 8 ports.
- Two slots on the front of the switch for hot swap-capable power supplies.
- Two slots on the front of the switch for fan modules. Each fan module houses six fans. The combination of six fans per module and two modules provides the switch with a total of 12-fans.

Chassis

The Cisco Nexus 5010 chassis is 1 RU, 1.72 inches tall, 17.3 inches wide and 30.0 inches deep. It is designed to be mounted in a standard 19-inch rack. The switch has two power supplies and two fans modules on the front of the switch. Ports are at the rear of the switch. The airflow is front to back.

[Figure 1-17](#) shows the front of the Cisco Nexus 5010 switch.

Figure 1-17 Cisco Nexus 5010 Switch Front View

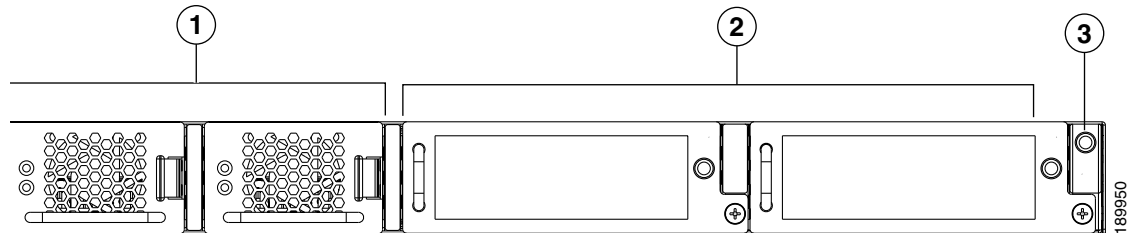


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1	Two power supplies	2	Two fan modules
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Figure 1-18 shows a close-up view of the front of the switch.

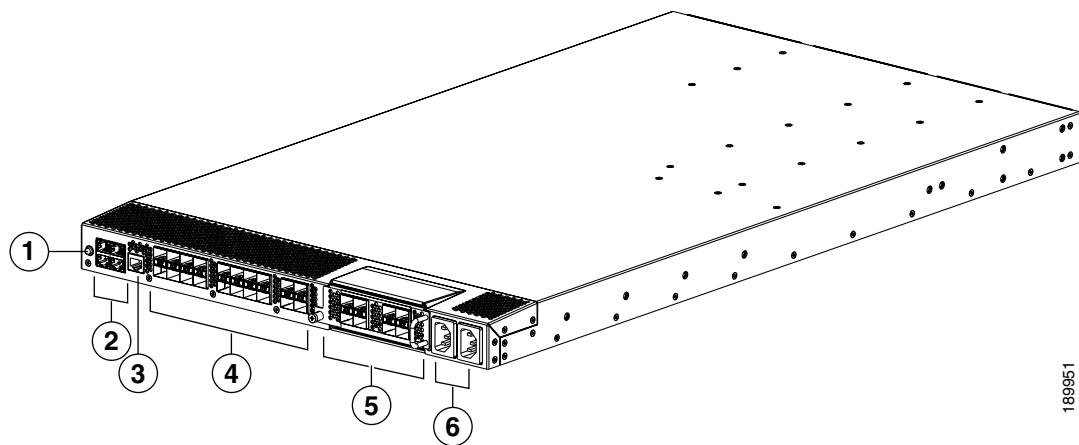
Figure 1-18 Cisco Nexus 5010 Switch Front View Close-up



1	Two power supplies	3	System status LED
2	Two fan modules		

The rear of the Cisco Nexus 5010 chassis has 20 fixed 10-Gigabit Ethernet ports, 1 slot for an optional expansion module, an Ethernet connector with 2 cross-connect ports and 2 management ports, a console port, and 2 AC power connectors. Figure 1-19 shows the rear of the Cisco Nexus 5010 switch.

Figure 1-19 Cisco Nexus 5010 Switch Rear View



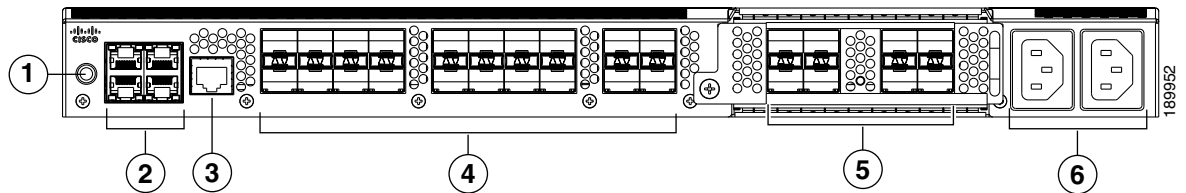
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1	System status LED	4	20 fixed 10-Gigabit Ethernet ports
2	Ethernet connector with two cross-connect ports on the left (top and bottom), and two network management ports on the right (top and bottom)	5	Expansion modules
3	Console port	6	AC power connectors

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Figure 1-20 shows a close-up view of the rear of the Cisco Nexus 5010 chassis.

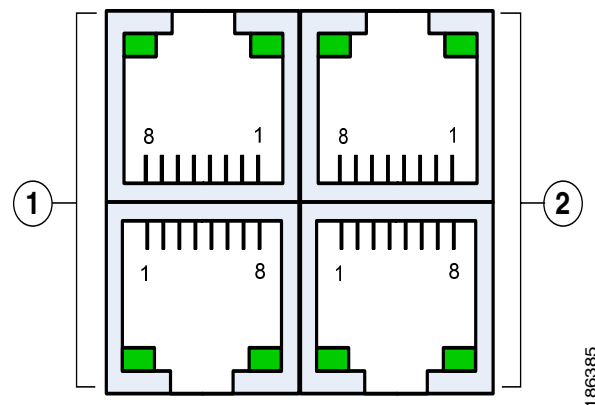
Figure 1-20 Cisco Nexus 5010 Switch Rear View Close-up



1	System status LED	4	Slot 1, with 20 fixed 10-Gigabit Ethernet ports (highlighted in red).
2	Ethernet connector with two cross-connect ports on left side, and two network management1 (top) and management2 (bottom) ports on the right side	5	Slot 2 for an optional expansion module
3	Console port	6	AC power connectors

The Ethernet connector port exposes four Ethernet ports that are in a 2x2 stacked RJ-45 jack. Figure 1-21 shows a close-up view of the Ethernet connector port.

Figure 1-21 Ethernet Connector Port



1	Internal cross connect ports	2	Network management ports
---	------------------------------	---	--------------------------

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Table 1-4 lists the LED descriptions for all Ethernet LEDs.

Table 1-4 Ethernet LED Descriptions

LED	Status	Description
Left	Off	No link
	Solid green	Physical link
Right	Off	No activity
	Blinking green	Activity

Expansion Modules

Expansion modules allow Cisco Nexus 5000 switches to be configured as cost-effective 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity. The Cisco Nexus 5010 switch has one slot for an optional uplink Gatos Expansion Module (GEM). There are several modules which can be accommodated in this slot. Three such modules are N5K-M1404, N5K-M1600 and N5K-M1008.

- N5K-M1404 provides 4 10G SFP+, and 4 Fiber Channel 1/2/4G SFP based uplink connections. The 10GE ports are encryption capable.
- M5K-M1600 provides 6 10G SFP+ based uplink connections.
- N5K-M1008 provides 8 1/2/4G Fiber Channel, SFP based uplink connection.

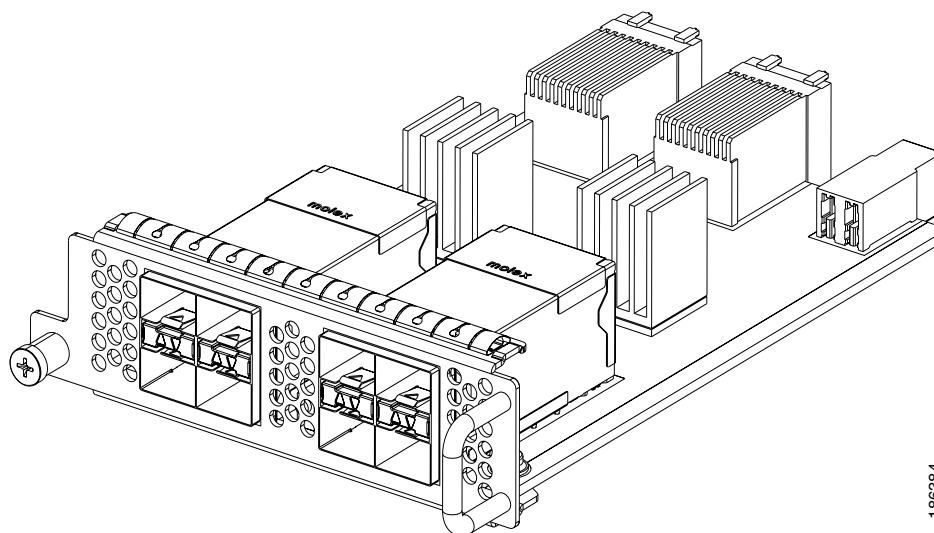
The chassis supports hot swapping of the expansion modules.

N5K-M1404

The N5K-M1404 GEM supports four SFP+ transceiver modules and four 1-, 2-, 4-Gbps Fibre Channel transceivers. The Fibre Channel plus Ethernet expansion module is a field-replaceable unit (FRU).

Figure 1-22 shows the Fibre Channel plus Ethernet expansion module.

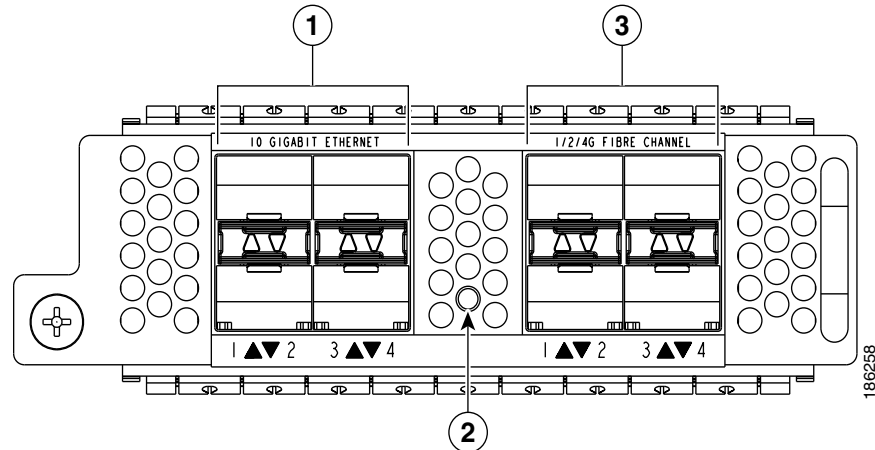
Figure 1-22 N5K-M1404 Gatos Expansion Module



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Figure 1-23 shows the front of the Fibre Channel plus Ethernet expansion module. Figure 1-11 shows how ports are numbered on the Fibre Channel plus Ethernet expansion module.

Figure 1-23 Front of the N5K-M1404 GEM

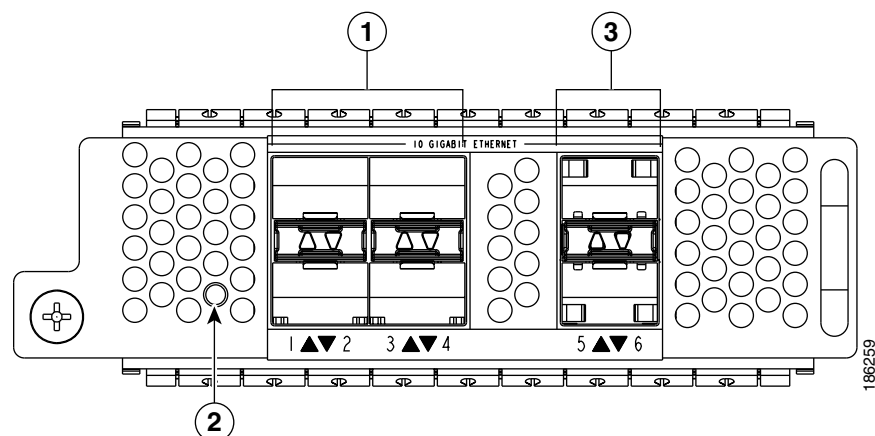


1	Four 10-Gigabit Ethernet ports	3	Four 1-, 2-, 4-Gbps Fibre Channel ports
2	Module LED		

N5K-M1600

The N5K-M1600 GEM supports 6 10G SFP+ based uplink connections. Figure 1-24 shows the N5K-M1600 GEM.

Figure 1-24 N5K-M1600 GEM



1 & 3	Six 10-Gigabit Ethernet ports	2	Module LED
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See [Figure 1-12](#) for an illustration of how ports are grouped and numbered on the Ethernet expansion module.

N5K-M1008

The N5K-M1008 GEM supports 8 1/2/4G Fiber Channel, SFP based uplink connection. [Figure 1-25](#) shows the N5K-M1008 GEM.

Figure 1-25 **N5K-M1008 GEM**

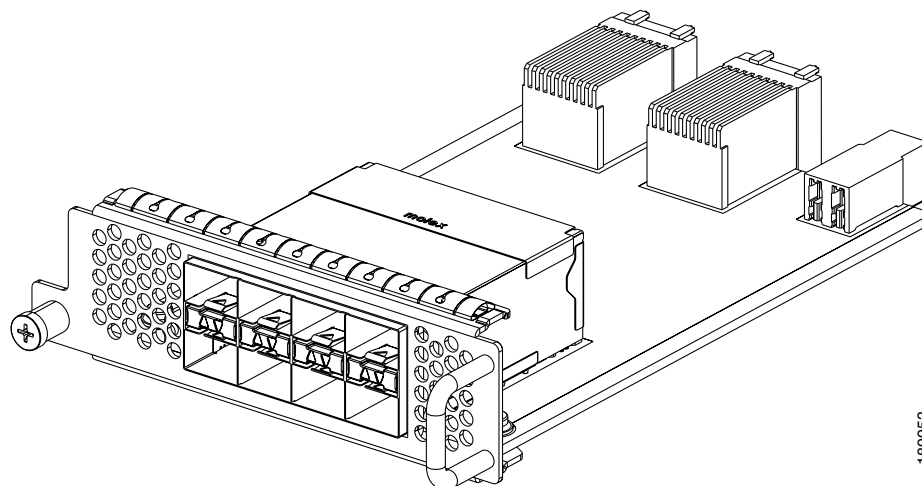
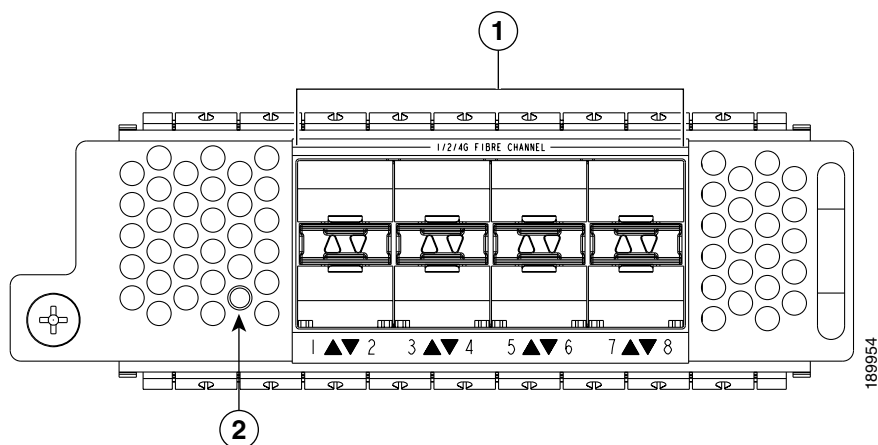


Figure 1-26 **Front of the N5K-M1008 GEM**



1	Eight 1-, 2-, 4-Gbps Fibre Channel ports	2	LED
----------	--	----------	-----

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Ports

Each individual port on the Cisco Nexus 5010 switch is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right.

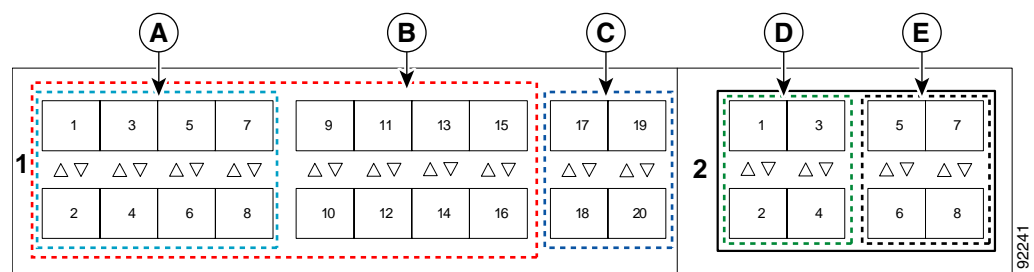
There are 20-28 ports on the Cisco Nexus 5010 switch, depending on which GEM is installed.

The 20 fixed ports form group 1 and are named *1/port_number*. Ports 1 through 16 are unencrypted Ethernet ports. Of these, ports 1 through 8 are 10-Gigabit Ethernet and 1-Gigabit Ethernet capable ports. Ports 17 through 20 are encryption-capable Ethernet ports.

Group 2 includes the ports in the GEM module. Group 2 ports 1 through 4 are encrypted Ethernet ports. Group 2 ports 5 through 8 are Fibre Channel ports.

Figure 1-27 shows how ports are numbered and grouped by function with the N5K-M1404 GEM installed.

Figure 1-27 Port Numbering of the Cisco Nexus 5010 switch configured with the N5K-M1404 GEM

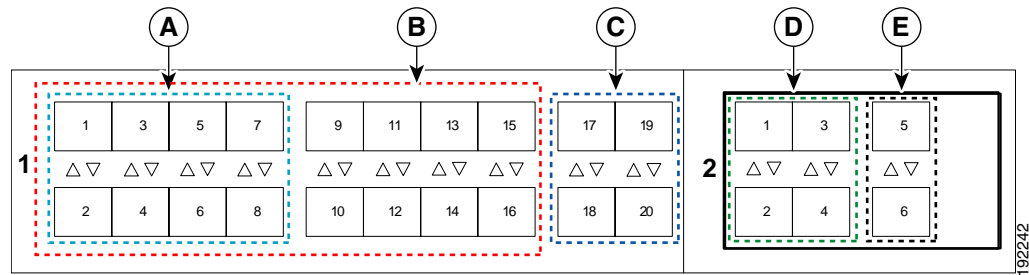


A	Group 1/ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	D	Group 2 ports 1 through 4: Encrypted Ethernet ports
B	Group 1/ports 1 through 16: Unencrypted Ethernet ports	E	Group 2 ports 5 through 8: Fibre Channel ports
C	Group 1/ports 17 through 20: Encrypted Ethernet ports		

Figure 1-28 shows how ports are numbered and grouped by function with the N5K-M1600 GEM installed.

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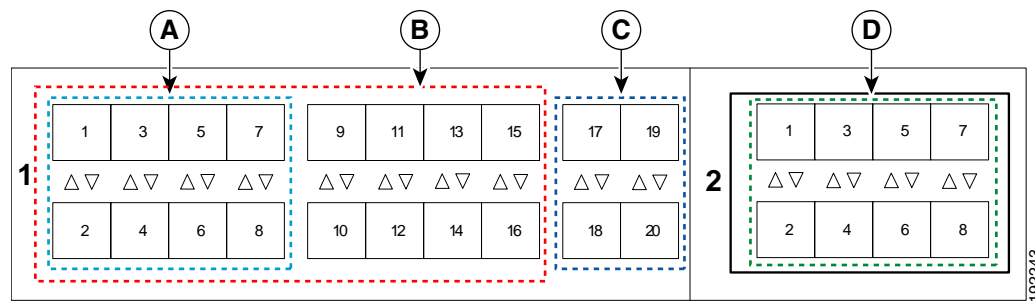
Figure 1-28 Port Numbering of the Cisco Nexus 5010 switch configured with the N5K-M1600 GEM



A	Group 1/ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	D	Group 2 ports 1 through 4: Encrypted Ethernet ports
B	Group 1/ports 9 through 16: Unencrypted Ethernet ports	E	Group 2 ports 5 and 8: Unencrypted Ethernet ports
C	Group 1/ports 17 through 20: Encrypted Ethernet ports		

Figure 1-29 shows how ports are numbered and grouped by function with the N5K-M1008 GEM installed.

Figure 1-29 Port Numbering of the Cisco Nexus 5010 switch configured with the N5K-M1008 GEM



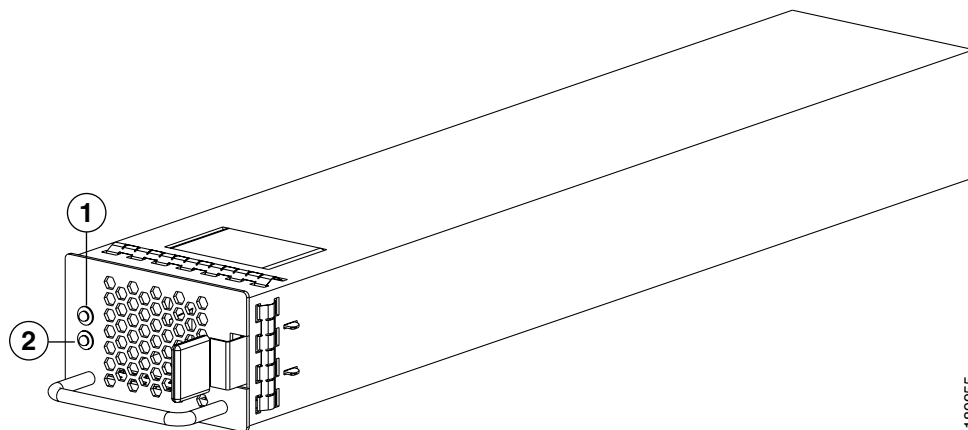
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A	Group 1/ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	D	Group 2 ports 1 through 8: Fibre Channel ports
B	Group 1/ports 1 through 16: Unencrypted Ethernet ports		
C	Group 1/ports 17 through 20: Encrypted Ethernet ports		

Power Supply

The Cisco Nexus 5010 switch uses a front-end power supply. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the Cisco Nexus 5010 switch is fully functional with one power supply. [Figure 1-30](#) shows the power supply, which has two LEDs: one for power status and one for failure condition.

Figure 1-30 Power Supply for the Cisco Nexus 5010 Switch



1	Amber fail LED indicates a failure condition.	2	Green power LED indicates the power status.
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[Table 1-5](#) table describes the status of the two power supply LEDs.

Table 1-5 Power Supply LED Descriptions

Power Supply Condition	Power LED Status	Fail LED Status
No AC power to all power supplies.	Off	Off
Power supply failure, including over voltage, over current, over temperature, and fan failure.	Off	On

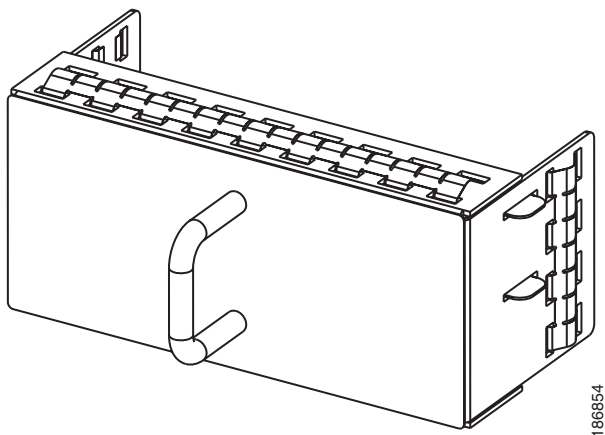
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Table 1-5 **Power Supply LED Descriptions (continued)**

Power Supply Condition	Power LED Status	Fail LED Status
Power supply warning events where the power supply continues to operate. These events include high temperature, high power, and slow fan.	Off	1 Hz Blinking
AC present, 3.3 voltage standby (VSB) on, and the power supply unit is off.	1 Hz blinking	Off
Power supply on and OK.	On	Off

If one power supply is installed in the chassis, but the other power supply slot is empty, a blank filler panel should be used to cover the empty slot. [Figure 1-31](#) shows a blank power supply filler panel.

Figure 1-31 **Blank Power Supply Filler Panel**

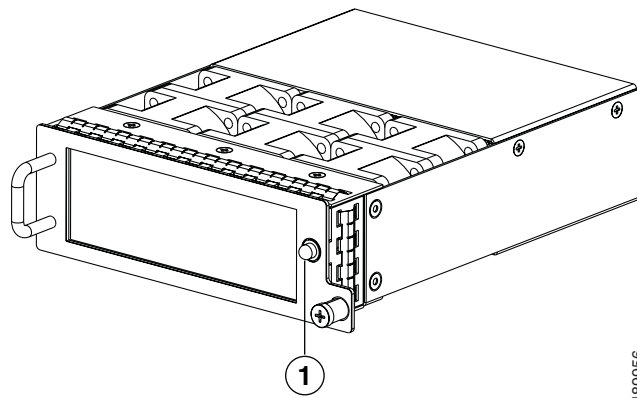


Fan Module

The Cisco Nexus 5010 switch has slots for two fans modules. Each fan module houses six fans. The combination of 6-fans per module and 2-modules provides the switch with a total of 12-fans. [Figure 1-32](#) shows the fan module.

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Figure 1-32 Cisco Nexus 5010 Fan Module



1	Fan module LED
----------	----------------

The bicolor fan module LED indicates fan tray health. Green indicates normal operation, while amber indicates a fan failure.

LED Descriptions

Table 1-6 describes the LEDs for the Cisco Nexus 5010 switch.

Table 1-6 LEDs for the Cisco Nexus 5010 Switch

LED	Location	Function	Color	Status	Description
Power LED	Front of Chassis	Chassis Power/Health	Green	Solid On	System is and on operation normally
				Off	Switch is powered off
			Amber	On	Fault condition
Fan Tray Status	Fan trays (front)	Fan tray health indicator (multi color)	Green	Solid On	Fan tray operating normally
			Amber	Solid On	Fan failure within the fan tray

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Table 1-6 LEDs for the Cisco Nexus 5010 Switch (continued)

LED	Location	Function	Color	Status	Description
PSU Status Indicators	Power supply (front)	PSU Health (multi color)	Green	OFF	No AC power to power supply
				Solid On	Power supply on and OK
			Amber	Solid On	Power supply failures, over voltage, over current, over temperature
				1 Hz blinking	AC present, 3.3VSB on, PSU is off
				OFF	Operating normally
GEM Cards Health Indicator	back of chassis	An indicator to show there is a fault with any one of the GEM card	Green	On	GEM card is operating normally
			Amber	Solid on	A fault has occurred on the GEM card.

Port Level LED's

There are twenty to twenty-six port activity LED's on switch depending on whether the GEM is a Fibre Channel or 10GE. The table summarizes the behavior of the port LED's.

Link State	LED State	Notes
Link Down	OFF	
POST failed on port	AMBER blinking yellow	
Administrative disabled	AMBER_ON	Depending on the product you look at, the LED could be off, or solid amber.
Link Up, port in STP forwarding state	GREEN_ON	Blinks based on network activity

Supported SFP Transceivers

The Cisco Nexus 5010 switch supports both SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

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SFP+ Transceivers

The enhanced Small-Form-Factor Pluggable (SFP+) 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface. The Cisco Nexus 5010 switch supports the following SFP+ optical transceivers:

- SR
- DCR, SR-Lite (shorter reach than SR)
- LRM (for uplink only)
- LR (for uplink only)

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—short range SFP+ module
SFP-10G-LR	10-Gigabit Ethernet—long range SFP+ module

SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. The cables come in the following lengths:

- 1m, 30AWG
- 3m, 28-30 AWG
- 5m, 26-28 AWG
- 7m, 24-26 AWG

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter
SFP-H10GB-CU7M	10GBASE-CU SFP+ Cable 7 Meter

SFP Fiber Channel Transceivers

The Cisco Nexus 5010 switch supports the multimode 850nm 4Gbps SFP with 150m reach.

Model	Description
DS-SFP-FC4G-SW	4 Gbps Fibre Channel-SW SFP, LC
DS-SFP-FC4G-LW	4 Gbps Fibre Channel-LW SFP, LC, (10km Reach)

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CHAPTER 2

Installing the Cisco Nexus 5000 Switch

This chapter describes how to install the Cisco Nexus 5000 switch, and it includes the following information:

- [Preparing for Installation, page 2-2](#)
- [Installing the Cisco Nexus 5020 Chassis in a Cabinet or Rack, page 2-5](#)
- [Grounding the System, page 2-10](#)
- [Grounding the Chassis, page 2-15](#)
- [Starting the Switch, page 2-17](#)
- [Removing and Installing Components, page 2-18](#)
- [Repacking the Cisco Nexus 5000 Switch for Return Shipment, page 2-26](#)



Note

Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for the Cisco Nexus 5000 Family* for important safety information.



Warning

IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.
Statement 1071

SAVE THESE INSTRUCTIONS



Warning

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.
Statement 1017



Warning

Only trained and qualified personnel must be allowed to install, replace, or service this equipment.
Statement 1030

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**Note**

Each new switch requires a license. For information on licensing, see the *Cisco Nexus 5000 Series CLI Configuration Guide*.

Preparing for Installation

This section includes the following topics:

- [Installation Options, page 2-2](#)
- [Installation Guidelines, page 2-3](#)
- [Required Equipment, page 2-4](#)
- [Unpacking and Inspecting the Switch, page 2-4](#)

Installation Options

The Cisco Nexus 5000 switch can be installed using the following methods:

- In an open EIA rack, using the following items:
 - The rack-mount kit shipped with the switch
 - The EIA Shelf Bracket Kit (an optional kit, purchased separately)
- In a perforated or solid-walled EIA cabinet, using:
 - The rack-mount kit shipped with the switch
 - The EIA Shelf Bracket Kit (an optional kit, purchased separately)

For instructions on installing the switch using the rack-mount kit shipped with the switch, see the [“Installing the Cisco Nexus 5020 Chassis in a Cabinet or Rack”](#) section on page 2-5.

**Note**

The optional EIA Shelf Bracket Kit is not provided with the switch. To order the kit, contact your switch provider.

Airflow Considerations

Airflow through the Cisco Nexus 5000 switch is from front to back. Air enters the chassis through the fan trays and power supplies mounted at the front of the chassis and exits the chassis through perforations on the rear of the chassis. To ensure proper airflow, follow these guidelines:

- Maintain ambient airflow throughout the data center to ensure normal operation.
- Consider the heat dissipation of all equipment when determining air-conditioning requirements. When evaluating airflow requirements, take into consideration that hot air generated by equipment at the bottom of the rack can be drawn in the intake ports of the equipment above.

Chassis Weight

When lifting the system, follow these guidelines:

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- Disconnect all power and external cables before lifting the system.
- Have two people to lift the system. The Nexus 5020 weighs 50 lb (22.680 kg) and the Nexus 5010 weighs 35 lb.
- Ensure that your footing is solid and the weight of the system is evenly distributed between your feet.
- Lift the system slowly, keeping your back straight. Lift with your legs, not with your back. Bend at the knees, not at the waist.

Installation Guidelines

When installing the Cisco Nexus 5000 switch, follow these guidelines:

- Plan your site configuration and prepare the site before installing the chassis. [Appendix D, “Site Planning and Maintenance Records,”](#) lists the recommended site planning tasks.
- Record the information listed in [Appendix D, “Site Planning and Maintenance Records,”](#) as you install and configure the switch.
- Ensure that there is adequate space around the switch to allow for servicing the switch and for adequate airflow ([Appendix B, “Technical Specifications,”](#) lists airflow requirements).
- Ensure that the air-conditioning meets the heat dissipation requirements listed in [Appendix B, “Technical Specifications.”](#)
- Ensure that the cabinet or rack meets the requirements listed in [Appendix A, “Cabinet and Rack Installation.”](#)



Note Jumper power cords are available for use in a cabinet. See the [“Jumper Power Cord” section on page C-10.](#)

- Ensure that the chassis is adequately grounded. If the switch is not mounted in a grounded rack, we recommend connecting both the system ground on the chassis and the power supply ground to an earth ground.
- Ensure that the site power meets the power requirements listed in [Appendix B, “Technical Specifications.”](#) If available, you can use an uninterruptible power supply (UPS) to protect against power failures.



Caution Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco Nexus 5000 switch, which can have substantial current draw fluctuations because of fluctuating data traffic patterns.

- Ensure that circuits are sized according to local and national codes. For North America, the power supply requires a 15-A or 20-A circuit.



Caution To prevent loss of input power, ensure the total maximum loads on the circuits supplying power to the switch are within the current ratings for the wiring and breakers.

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- Use the following screw torques when installing the switch:
 - Captive screws: 4 in-lb
 - M3 screws: 4 in-lb
 - M4 screws: 12 in-lb
 - 10-32 screws: 20 in-lb
 - 12-24 screws: 30 in-lb

Required Equipment

Before beginning the installation, ensure that the following items are ready:

- Number 1 and number 2 Phillips screwdrivers with torque capability
- 3/16-in. flat-blade screwdriver
- Tape measure and level
- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

The following additional items (not found in the accessory kit) are required to ground the chassis:

- Grounding cable (6 AWG recommended), sized according to local and national installation requirements; the required length depends on the proximity of the Cisco Nexus 5000 switch to proper grounding facilities
- Crimping tool large enough to accommodate girth of lug
- Wire-stripping tool

Unpacking and Inspecting the Switch



Caution

When handling switch components, wear an ESD strap and handle modules by the carrier edges only. An ESD socket is provided on the chassis. For the ESD socket to be effective, the chassis must be grounded through the power cable, the chassis ground, or the metal-to-metal contact with a grounded rack.



Tip

Keep the shipping container in case the chassis requires shipping in the future.



Note

The switch is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

To inspect the shipment, follow these steps:

Step 1

Compare the shipment to the equipment list provided by your customer service representative and verify that you have received all items, including the following:

- Print documentation

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- Grounding lug kit
- Rack-mount kit
- ESD wrist strap
- Cables with connectors
- Any optional items ordered

Step 2 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

- Invoice number of shipper (see packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Installing the Cisco Nexus 5020 Chassis in a Cabinet or Rack

This section describes how to use the rack-mount kit provided with the switch to install the Cisco Nexus 5020 switch into a cabinet or rack that meets the requirements described in [Appendix A, “Cabinet and Rack Installation.”](#) All Cisco Nexus 5020 switch switches use the same installation procedure.



Caution

If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

[Table 2-1](#) lists the items contained in the rack-mount kit provided with the switch.

Table 2-1 *Cisco Nexus 5020 Switch Rack-Mount Kit*

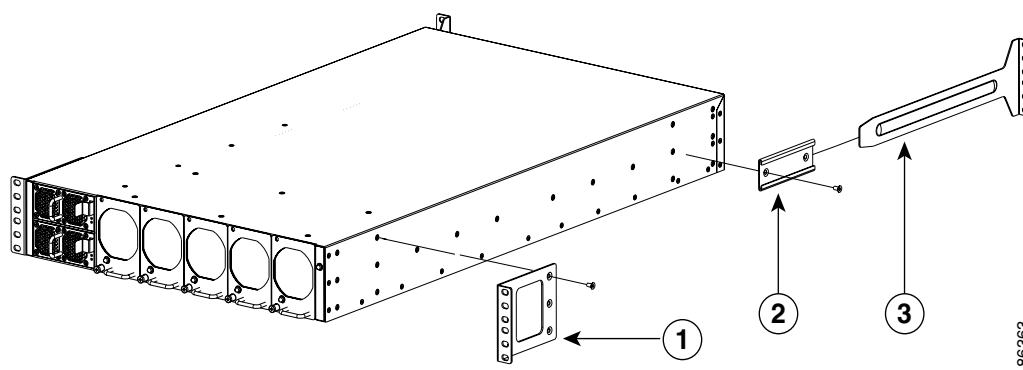
Quantity	Part Description
2	Rack-mount brackets
16	M4x0.7 x 8-mm Phillips countersunk screws
2	Rack-mount guides
12	10-32 Rack Nuts
12	10-32 x 3/4-inch Phillips countersunk screws
2	Slider rails

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To install the switch in a cabinet or rack using the rack-mount kit provided with the switch, follow these steps:

- Step 1** Install the front rack-mount brackets as follows:
- Position a front rack-mount bracket against the chassis and align the screw holes as shown in [Figure 2-1](#). Then attach the front rack-mount bracket to the chassis with six of the M4 screws.
 - Repeat with the other front rack-mount bracket on the other side of the switch.

Figure 2-1 Attaching Front Rack-Mount Bracket to the Cisco Nexus 5020 switch

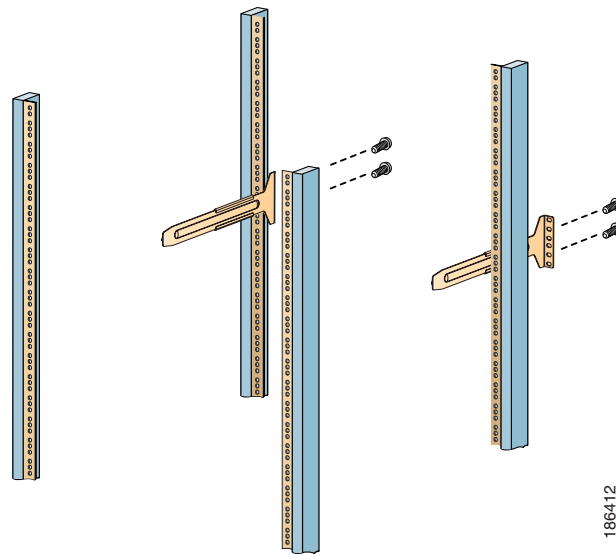


1	Front rack-mount bracket	3	Slider rail
2	Rack-mount guides		

- Step 2** Install the rack-mount guides on the switch as follows:
- Position one of the rack-mount brackets against the side of the switch and align the screw holes as shown in [Figure 2-1](#). Then attach the bracket to the switch with two of the flat-head M4 screws.
 - Repeat with the other rack-mount bracket on the other side of the switch.
- Step 3** Attach the slider rails to the rack as shown in [Figure 2-2](#). Use two 12-24 screws or two 10-32 screws, depending on the rack rail thread type. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.
- Repeat with the other slider rail on the other side of the rack.
 - Use the tape measure and level to verify that the rails are horizontal and at the same height.

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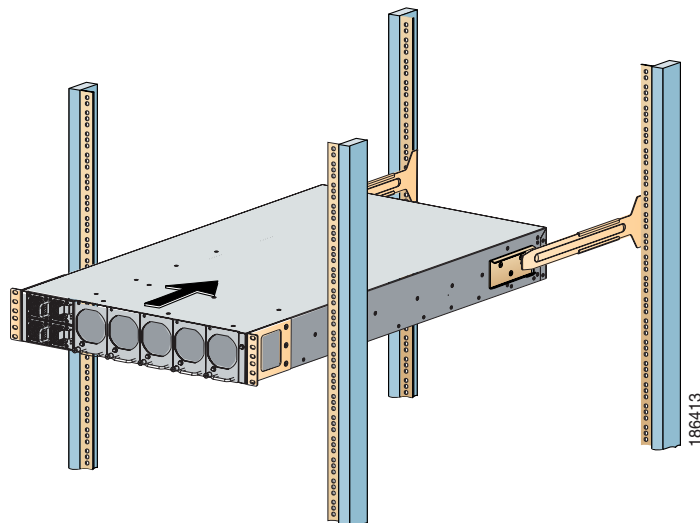
Figure 2-2 Installing the Slider Rails



Step 4 Insert the switch into the rack:

- a. Using both hands, position the switch with the back of the switch between the front posts of the rack.
- b. Align the two rack-mount guides on either side of the switch with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails, and then gently slide the switch all the way into the rack. See [Figure 2-3](#). If the switch does not slide easily, try realigning the rack-mount guides on the slider rails.

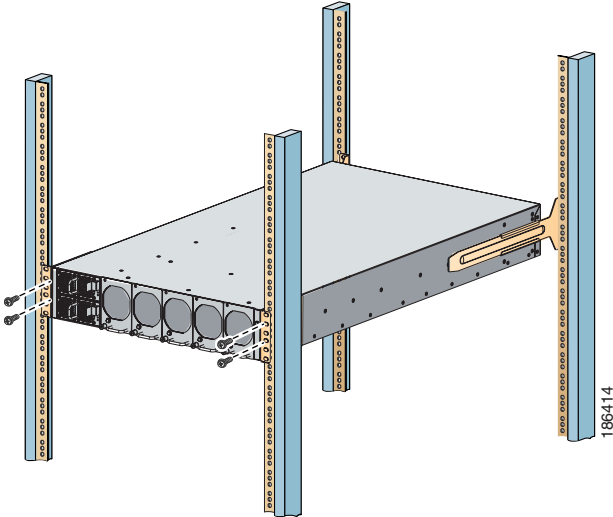
Figure 2-3 Sliding the Chassis Into the Rack



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- Step 5** Stabilize the switch in the rack by attaching the front rack-mount brackets to the front rack-mounting rails:
- Insert two screws (12-24 or 10-32, depending on rack type) through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail. See [Figure 2-4](#).
 - Repeat for the front rack-mount bracket on the other side of the switch.

Figure 2-4 Attaching the Switch to the Rack



Installing the Cisco Nexus 5010 Chassis in a Cabinet or Rack

This section describes how to use the rack-mount kit provided with the switch to install the Cisco Nexus 5010 switch into a cabinet or rack that meets the requirements described in [Appendix A, “Cabinet and Rack Installation.”](#) All Cisco Nexus 5000 switches use the same installation procedure.



Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

[Table 2-1](#) lists the items contained in the rack-mount kit provided with the switch.

Table 2-2 Cisco Nexus 5010 Switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
12	M4x0.7 x 8-mm Phillips countersunk screws
2	Rack-mount guides
10	10-32 Rack Nuts
10	10-32 x 3/4-inch Phillips countersunk screws
2	Slider rails

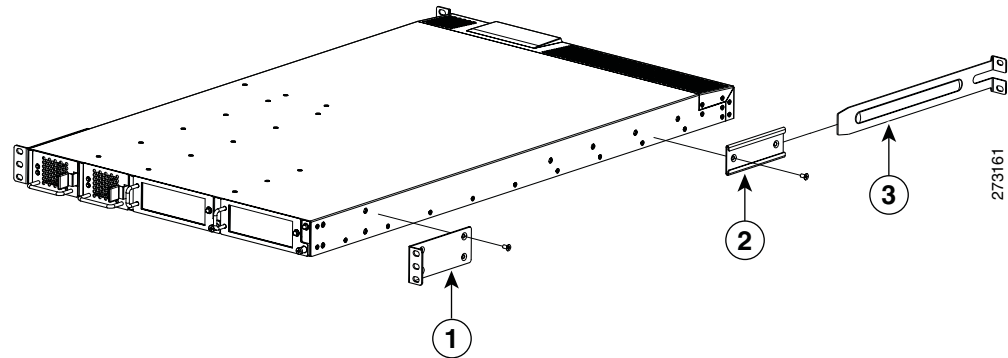
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To install the switch in a cabinet or rack using the rack-mount kit provided with the switch, follow these steps:

Step 1 Install the front rack-mount brackets as follows:

- a. Position a front rack-mount bracket against the chassis and align the screw holes as shown in [Figure 2-1](#). Then attach the front rack-mount bracket to the chassis with six of the M4 screws.
- b. Repeat with the other front rack-mount bracket on the other side of the switch.

Figure 2-5 Attaching Front Rack-Mount Bracket to the Cisco Nexus 5010 switch



1	Front rack-mount bracket	3	Slider rail
2	Rack-mount guides		

Step 2 Install the rack-mount guides on the switch as follows:

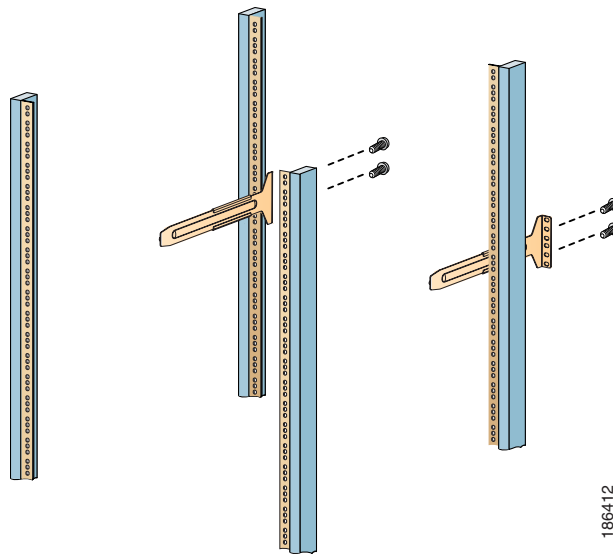
- a. Position one of the rack-mount brackets against the side of the switch and align the screw holes. This procedure is the same as that for the Cisco Nexus 5020 switch. See [Figure 2-1](#). Then attach the bracket to the switch with two of the flat-head M4 screws.
- b. Repeat with the other rack-mount bracket on the other side of the switch.

Step 3 Attach the slider rails to the rack. This procedure is the same as that for the Cisco Nexus 5020 switch. See [Figure 2-2](#). Use two 12-24 screws or two 10-32 screws, depending on the rack rail thread type. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.

- a. Repeat with the other slider rail on the other side of the rack.
- b. Use the tape measure and level to verify that the rails are horizontal and at the same height.

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Figure 2-6 **Installing the Slider Rails**



- Step 4** Insert the switch into the rack:
- Using both hands, position the switch with the back of the switch between the front posts of the rack.
 - Align the two rack-mount guides on either side of the switch with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails, and then gently slide the switch all the way into the rack. This procedure is the same as that for the Cisco Nexus 5020 switch. See [Figure 2-3](#). If the switch does not slide easily, try realigning the rack-mount guides on the slider rails.
- Step 5** Stabilize the switch in the rack by attaching the front rack-mount brackets to the front rack-mounting rails:
- Insert two screws (12-24 or 10-32, depending on rack type) through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail. This procedure is the same as that for the Cisco Nexus 5020 switch. See [Figure 2-4](#).
 - Repeat for the front rack-mount bracket on the other side of the switch.

Grounding the System

This section describes the need for system grounding and explains how to prevent damage from electrostatic discharge.

Proper Grounding Practices

Grounding is one of the most important parts of equipment installation. Proper grounding practices ensure that the buildings and the installed equipment within them have low-impedance connections and low-voltage differentials between chassis. When you properly ground systems during installation, you reduce or prevent shock hazards, equipment damage due to transients, and data corruption. [Table 2-3](#) lists some general grounding practice guidelines.

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Table 2-3 Proper Grounding Guidelines

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
Commercial building is subjected to direct lightning strikes. For example, some places in the United States, such as Florida, are subject to more lightning strikes than other areas.	High	All lightning protection devices must be installed in strict accordance with manufacturer recommendations. Conductors carrying lightning current should be spaced away from power and data lines in accordance with applicable recommendations and codes. Best grounding recommendations must be closely followed.
Commercial building is located in an area where lightning storms frequently occur but is not subject to direct lightning strikes.	High	Best grounding recommendations must be closely followed.
Commercial building contains a mix of information technology equipment and industrial equipment, such as welding.	Medium to high	Best grounding recommendations must be closely followed.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment. This installation has a history of malfunction due to electromagnetic noise.	Medium	Determine source and cause of noise if possible, and mitigate as closely as possible at the noise source or reduce coupling from the noise source to the affected equipment. Best grounding recommendations must be closely followed.
New commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system in a new building is often the least expensive route and the best way to plan for the future. Best grounding recommendations should be followed as closely as possible.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system is always recommended. Best grounding recommendations should be followed as much as possible.

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**Note**

In all situations, grounding practices must comply with local National Electric Code (NEC) requirements or local laws and regulations.

**Note**

Always ensure that all of the modules are completely installed and that the captive installation screws are fully tightened. In addition, ensure that all I/O cables and power cords are properly seated. These practices are normal installation practices and must be followed in all installations.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when modules or other FRUs are improperly handled, results in intermittent or complete failures. Modules consist of printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, always use an ESD grounding strap when handling modules.

For preventing ESD damage, follow these guidelines:

- Always use an ESD wrist strap and ensure that it makes maximum contact with bare skin.
- ESD grounding straps are available with banana plugs, metal spring clips, or alligator clips. All Cisco Nexus 5000 Series chassis are equipped with a banana plug connector (identified by the ground symbol next to the connector) somewhere on the front panel. We recommend that you use a personal ESD grounding strap equipped with a banana plug.
- If you choose to use the disposable ESD wrist strap supplied with most FRUs or an ESD wrist strap equipped with an alligator clip, you must attach the system ground lug to the chassis in order to provide a proper grounding point for the ESD wrist strap.

**Note**

This system ground is also referred to as the network equipment building system (NEBS) ground.

- If your chassis does not have the system ground attached, you must install the system ground lug. See [“Establishing the System Ground” section on page 2-14](#) for installation instructions and location of the chassis system ground pads.

**Note**

You do not need to attach a supplemental system ground wire to the system ground lug; the lug provides a direct path to the bare metal of the chassis.

After you install the system ground lug, follow these steps to correctly attach the ESD wrist strap:

Step 1

Attach the ESD wrist strap to bare skin as follows:

- a. If you are using the ESD wrist strap supplied with the FRUs, open the wrist strap package and unwrap the ESD wrist strap. Place the black conductive loop over your wrist and tighten the strap so that it makes good contact with your bare skin.
- b. If you are using an ESD wrist strap equipped with an alligator clip, open the package and remove the ESD wrist strap. Locate the end of the wrist strap that attaches to your body and secure it to your bare skin.

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Step 2 Grasp the spring or alligator clip on the ESD wrist strap and momentarily touch the clip to a bare metal spot (unpainted surface) on the rack. We recommend that you touch the clip to an unpainted rack rail so that any built-up static charge is then safely dissipated to the entire rack.

Step 3 Attach either the spring clip or the alligator clip to the ground lug screw as follows (See [Figure 2-7](#)):

- a. If you are using the ESD wrist strap that is supplied with the FRUs, squeeze the spring clip jaws open, position the spring clip to one side of the system ground lug screw head, and slide the spring clip over the lug screw head so that the spring clip jaws close behind the lug screw head.

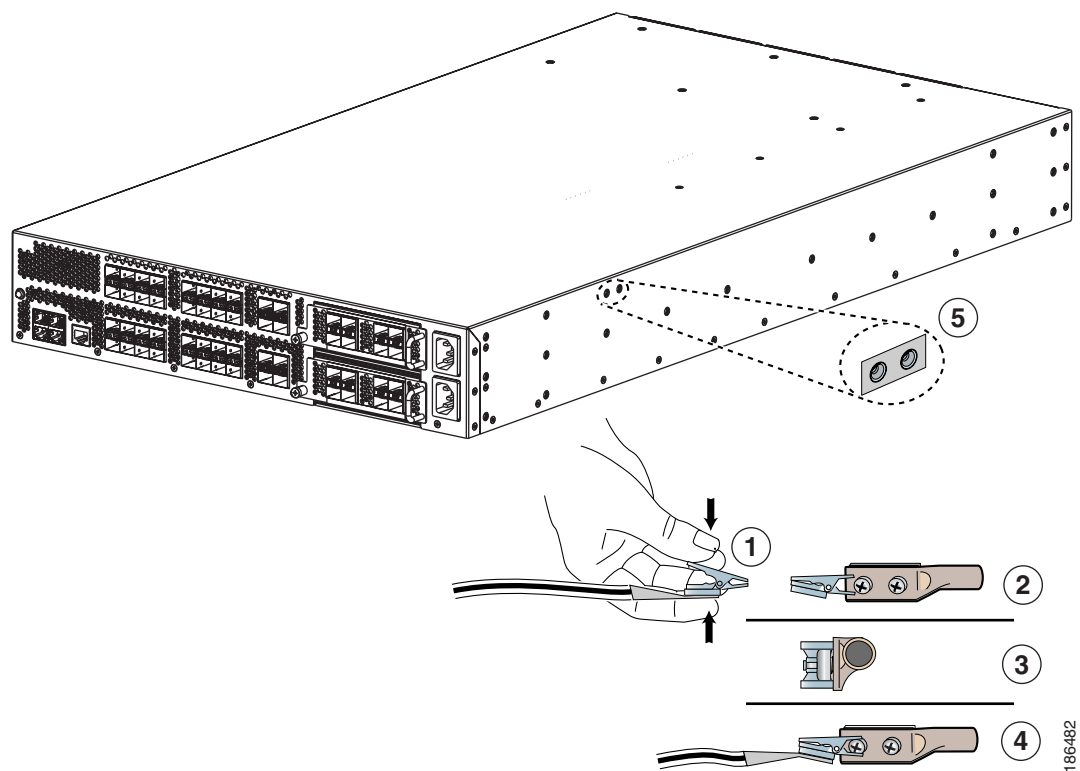


Note The spring clip jaws do not open wide enough to fit directly over the head of the lug screw or the lug barrel.

- b. If you are using an ESD wrist strap that is equipped with an alligator clip, attach the alligator clip directly over the head of the system ground lug screw or to the system ground lug barrel.

The following illustration displays how to attach the ESD Wrist Strap to the System Ground Lug Screw for the 5020 switch. Follow the same procedure for the 5010 switch.

Figure 2-7 Attaching the ESD Wrist Strap to the System Ground Lug Screw



1	ESD ground strap	3	Side view of grounding lug (clip slid behind screw)
2	Clip and grounding lug	4	Clip installed (behind screw)
5	System ground connector		

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In addition, follow these guidelines when handling modules:

- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed component board-side-up on an antistatic surface or in a static-shielding container. If you plan to return the component to the factory, immediately place it in a static-shielding container.
- Never attempt to remove the printed circuit board from the metal carrier.

**Caution**

For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohm (Mohm).

Establishing the System Ground

This section describes how to connect a system ground to the Cisco Nexus 5000 switch.

**Note**

This system ground is also referred to as the network equipment building system (NEBS) ground.

You must use the system (NEBS) ground on AC-powered systems if you are installing this equipment in a U.S. or European Central Office.

The system (NEBS) ground provides additional grounding for EMI shielding requirements and grounding for the low-voltage supplies (DC-DC converters) on the modules, and is intended to satisfy the Telcordia Technologies NEBS requirements for supplemental bonding and grounding connections. You must observe the following system grounding guidelines for your chassis:

- You must install the system (NEBS) ground connection with any other rack or system power ground connections that you make. The system ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You must connect both the system (NEBS) ground connection and the power supply ground connection to an earth ground. The system (NEBS) ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You do not need to power down the chassis because the Cisco Nexus 5020 switch is equipped with AC-input power supplies.

Required Tools and Equipment

To connect the system ground, you need the following tools and materials:

- Grounding lug—A two-hole standard barrel lug. Supports up to 6 AWG wire. Supplied as part of accessory kit.
- Grounding screws—Two M4 x 8mm (metric) pan-head screws. Supplied as part of the accessory kit.
- Grounding wire—Not supplied as part of accessory kit. The grounding wire should be sized according to local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations. Commercially available 6 AWG wire is recommended. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
- No. 1 Phillips screwdriver.

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- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Grounding the Chassis

The chassis has a grounding pad with two threaded M4 holes for attaching a grounding lug. [Figure 2-8](#) shows the system ground location on the Cisco Nexus 5020 switch. It is identical for the Cisco Nexus 5010 switch.



When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046



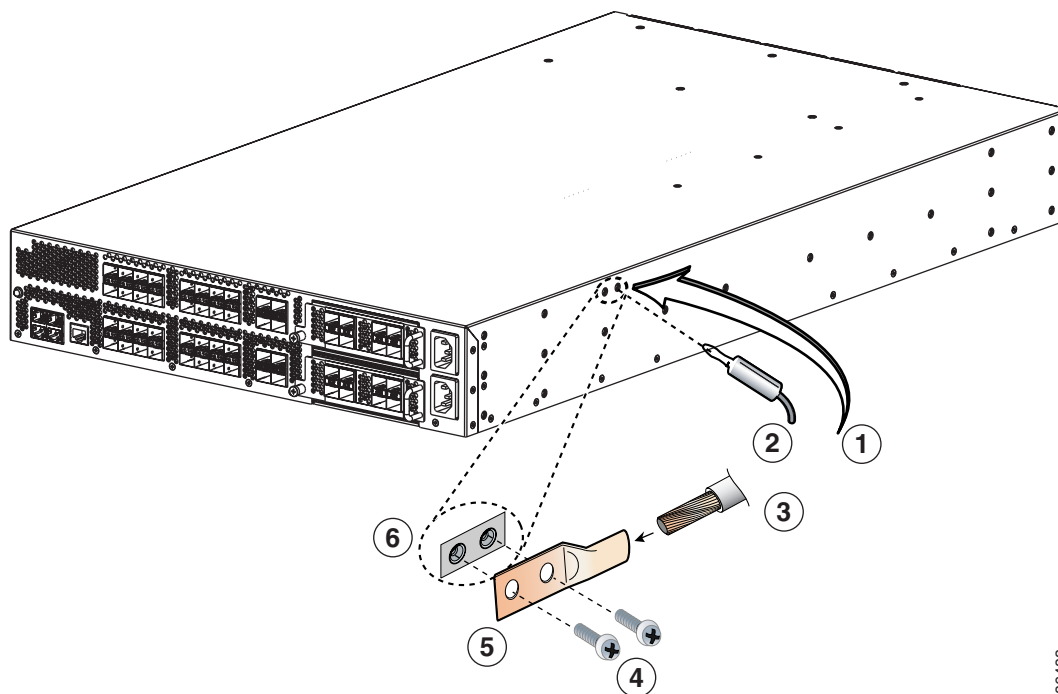
We recommend grounding the chassis, even if the rack is already grounded.



All power supplies must be grounded. The receptacles of the AC power cables used to provide power to the chassis must be the grounding type, and the grounding conductors should connect to protective earth ground at the service equipment.

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Figure 2-8 Location of System Ground on a Cisco Nexus 5000 Switch



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1	ESD socket (on switch)	4	Screws, M4, with square cone washers
2	ESD plug	5	NRTL listed grounding lug
3	Grounding cable	6	Close-up of grounding pad on switch



Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last.

Statement 1046



Caution

Grounding the chassis is required if you are using DC power supplies, even if the rack is already grounded. A grounding pad with two threaded M4 holes is provided on the chassis for attaching a grounding lug. The ground lug must be NRTL listed. In addition, the copper conductor (wires) must be used and the copper conductor must comply with NEC code for ampacity.

To attach the grounding lug and cable to the chassis, follow these steps:

- Step 1** Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the grounding cable.
- Step 2** Insert the stripped end of the grounding cable into the open end of the grounding lug.
- Step 3** Use the crimping tool to secure the grounding cable in the grounding lug.

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- Step 4** Remove the adhesive label from the grounding pad on the chassis.
 - Step 5** Place the grounding lug against the grounding pad so that there is solid metal-to-metal contact, and insert the two M4 screws with washers through the holes in the grounding lug and into the grounding pad.
 - Step 6** Ensure that the lug and cable do not interfere with other equipment.
 - Step 7** Prepare the other end of the grounding cable and connect it to an appropriate grounding point in your site to ensure adequate earth ground.
-

Starting the Switch

This section provides instructions for powering up the switch and verifying component installation.



Note

Do not connect the Ethernet port to the LAN until the initial switch configuration has been performed. For instructions on configuring the switch, see the *Cisco Nexus 5000 Series CLI Configuration Guide*. For instructions on connecting to the console port, see the “[Connecting to the Console Port](#)” section on [page 3-2](#).



Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last.

Statement 1046

To power up the switch and verify hardware operation, follow these steps:

- Step 1** Verify that empty power supply slots have filler panels installed, the faceplates of all modules are flush with the front of the chassis, and the captive screws of the power supplies, fan module, and all expansion modules are tight.
- Step 2** Verify that the power supply and the fan modules are installed.



Note

Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the Cisco Nexus 5000 switch to your outlet receptacle. See the “[Jumper Power Cord](#)” section on [page C-10](#).

- Step 3** Ensure that the switch is adequately grounded as described in the “[Grounding the System](#)” section on [page 2-10](#), and that the power cables are connected to outlets that have the required AC power voltages (see the “[Power Specifications](#)” section on [page B-2](#)).
- Step 4** Connect the power cable to an AC power source. The switch should power on as soon as you connect the power cable.
- Step 5** Listen for the fans; they should begin operating when the power cable is plugged in.

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- Step 6** After the switch boots, verify that the LED operation is as follows:
- Fan module—Status LED is green.
 - Power supply—Status LED is green.
 - After initialization, the system status LED is green, indicating that all chassis environmental monitors are reporting that the system is operational. If this LED is orange or red, then one or more environmental monitor is reporting a problem.
 - The Link LEDs for the Ethernet connector should not be on unless the cable is connected.



Note The link LEDs for the Fibre Channel ports remain yellow until the ports are enabled, and the LED for the Ethernet connector port remains off until the port is connected.

- Step 7** Try removing and reinstalling a component that is not operating correctly. If it still does not operate correctly, contact your customer service representative for a replacement.



Note If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco, contact Cisco Technical Support at this URL: <http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>.

- Step 8** Verify that the system software has booted and the switch has initialized without error messages. If any problems occur, see [Appendix E, “Troubleshooting Hardware Components”](#). If you cannot resolve an issue, contact your customer service representative.

- Step 9** Complete the worksheets provided in [Appendix D, “Site Planning and Maintenance Records”](#) for future reference.



Note A setup utility automatically launches the first time you access the switch and guides you through the basic configuration. For instructions on how to configure the switch and check module connectivity, see the *Cisco Nexus 5000 Series CLI Configuration Guide* or the *Cisco Nexus 5000 Series Fabric Manager Configuration Guide*.

Removing and Installing Components

This section includes the following topics:

- [Removing and Installing Expansion Modules, page 2-19](#)
- [Removing and Installing Power Supplies, page 2-21](#)
- [Removing and Installing the Fan Module, page 2-23](#)
- [Removing the Cisco Nexus 5000 Switch, page 2-25](#)



Caution To prevent ESD damage, wear grounding wrist straps during these procedures and handle modules by the carrier edges only.

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Removing and Installing Expansion Modules

**Caution**

To prevent ESD damage, wear grounding wrist straps during these procedures and handle expansion modules by the carrier edges only.

**Note**

Install the Cisco Nexus 5000 switch in the rack before installing expansion modules. For information about installing the chassis, see the [“Installing the Cisco Nexus 5020 Chassis in a Cabinet or Rack”](#) section on page 2-5 or [“Installing the Cisco Nexus 5010 Chassis in a Cabinet or Rack”](#) section on page 2-8

This section includes the following topics:

- [Installing an Expansion Module, page 2-19](#)
- [Removing an Expansion Module, page 2-20](#)

Installing an Expansion Module

To install an expansion module, follow these steps:

-
- | | |
|---------------|--|
| Step 1 | Grasp the handle of the module and place your other hand under the module to support it. |
| Step 2 | Gently slide the module into the opening until you cannot push it any further. |
| Step 3 | Tighten the captive screw on the front of the module. |
-

[Figure 2-9](#) shows the positioning of an expansion module in the 5020 chassis.

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Figure 2-9 Positioning the Module in the Cisco Nexus 5020 Chassis

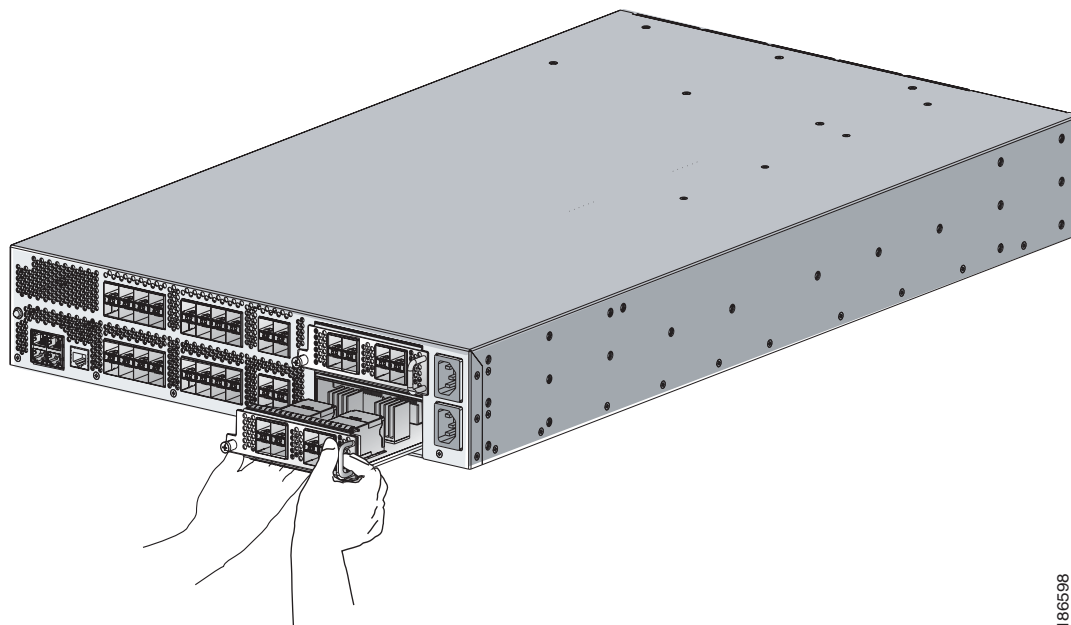
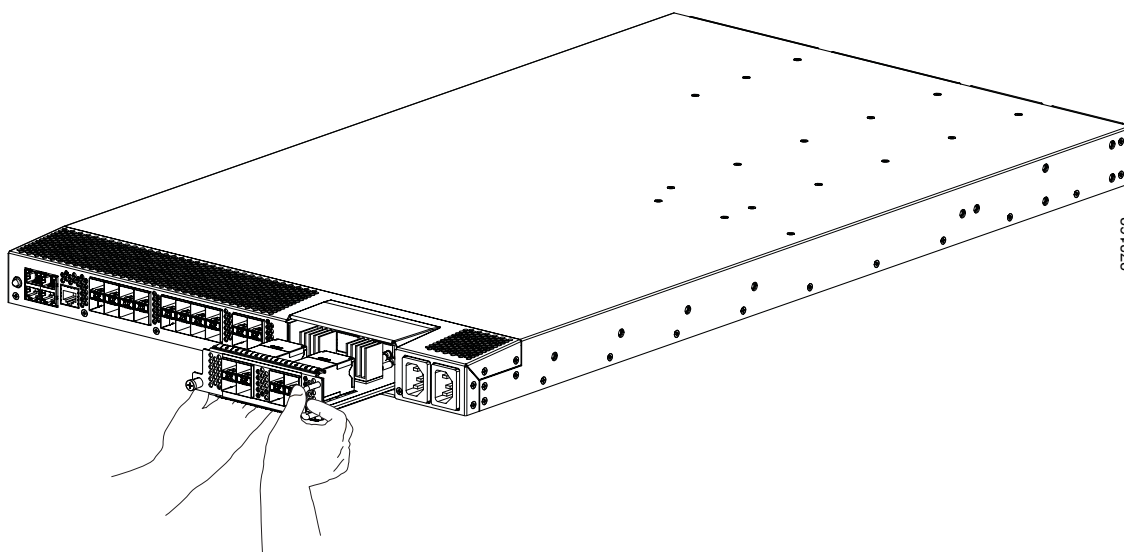


Figure 2-10 shows the positioning of an expansion module in the 5010 chassis.

Figure 2-10 Positioning the Module in the Cisco Nexus 5010 Chassis



Removing an Expansion Module

To remove an expansion module from the chassis, follow these steps:

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-
- | | |
|---------------|--|
| Step 1 | Disconnect any network interface cables attached to the module. |
| Step 2 | Loosen the captive screw on the module. |
| Step 3 | Remove the module from the chassis by grasping the handle on the right side of the module and sliding the module part of the way out of the slot. Place your other hand under the module to support the weight of it. Do not touch the module circuitry. |
| Step 4 | Place the module on an antistatic mat or antistatic foam if not immediately reinstalling it in another slot. |
| Step 5 | Install a filler panel to keep dust out of the chassis and maintain consistent airflow if the slot will remain empty. |
-

Removing and Installing Power Supplies

The Cisco Nexus 5000 switch supports two front-end power supplies, but it may be used with one power supply.

This section includes the following topics:

- [Removing a Power Supply, page 2-21](#)

**Note**

You can replace a faulty power supply while the system is operating provided the other power supply is functioning.

Removing a Power Supply

**Caution**

If you are using the Cisco Nexus 5000 switch with one power supply, removing the power supply will cause the switch to shut down. If you are using two power supplies and you remove one of them, the switch will continue to operate.

To remove a power supply, follow these steps:

-
- | | |
|---------------|--|
| Step 1 | Grasp the power supply handle with your left hand. |
| Step 2 | Push against the release latch with your left thumb and slide the power supply out of the chassis. See Figure 2-11 and Figure 2-12 . |
| Step 3 | Place your right hand under the power supply to support it while you slide it out of the chassis. |

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- Step 4** Install a blank power supply filler panel if the power supply bay is to remain empty.

Figure 2-11 *Removing the Power Supply for the Cisco Nexus 5020 switch*

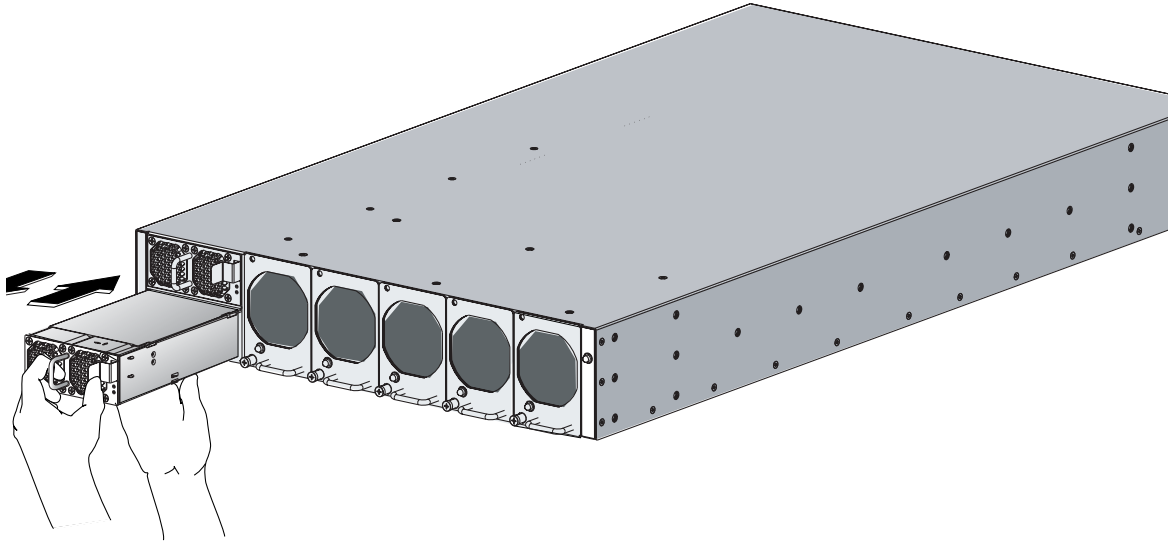
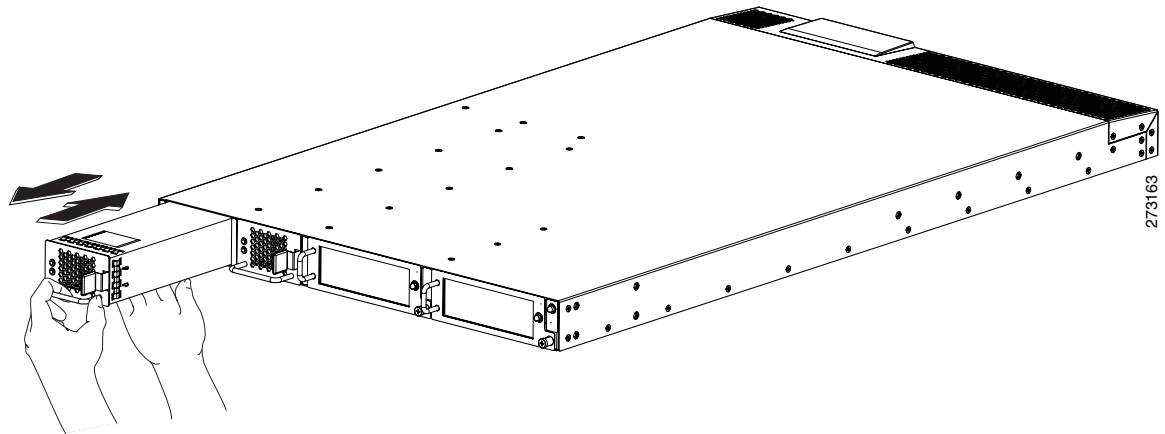


Figure 2-12 *Removing the Power Supply for the 5010*



Installing a Power Supply

To install a power supply, follow these steps:

- Step 1** Ensure that the system (earth) ground connection has been made. For ground connection instructions, see the [“Grounding the System”](#) section on page 2-10.

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- Step 2** If the power supply bay has a filler panel, press the latches on the sides of the filler panel, and then slide it out of the power supply bay.
- Step 3** Hold the power supply by the handle and position it so that the release latch is on the right, and then slide it into the power supply bay, ensuring that the power supply is fully seated in the bay.
- Step 4** Plug the power cable into the AC inlet connector at the rear of the chassis.
-

**Note**

Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the Cisco Nexus 5000 switch to your outlet receptacle. See the [“Jumper Power Cord”](#) section on page C-10.

- Step 5** Connect the other end of the power cable to an AC power source.

**Caution**

In a system with dual power supplies, connect each power supply to a separate power source. In case of a power source failure, the second source will most likely still be available.

- Step 6** Verify power supply operation by checking that the power supply LED is green
-

Removing and Installing the Fan Module

The fan module is designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system, provided the replacement is performed promptly.

This section includes the following topics:

- [Figure 2-14 Fan Module for the Cisco Nexus 5010 switch, page 2-24](#)
- [Installing a Fan Module, page 2-25](#)

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Figure 2-13 shows a fan module partially installed in the Cisco Nexus 5020 switch.

Figure 2-13 Fan Module for the Cisco Nexus 5020 switch

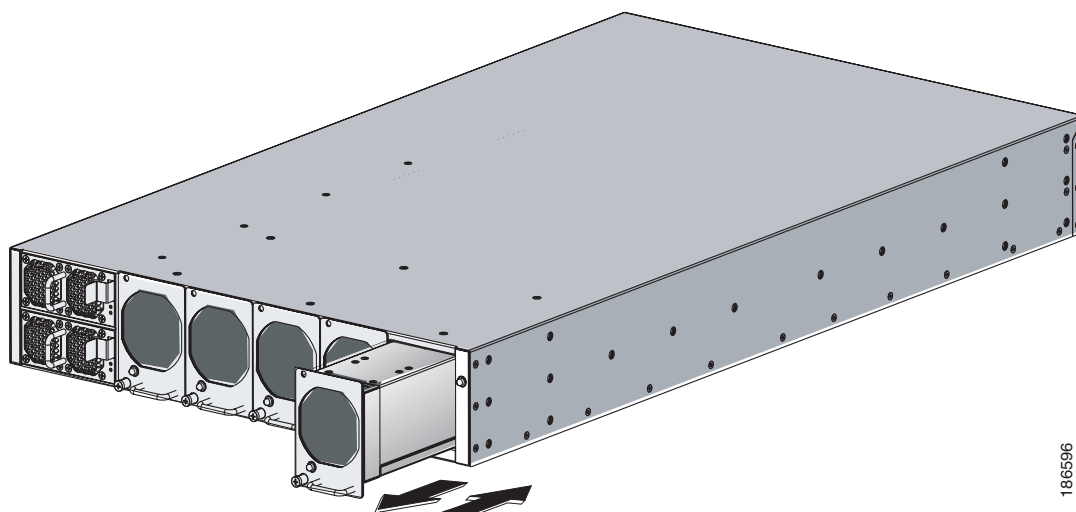
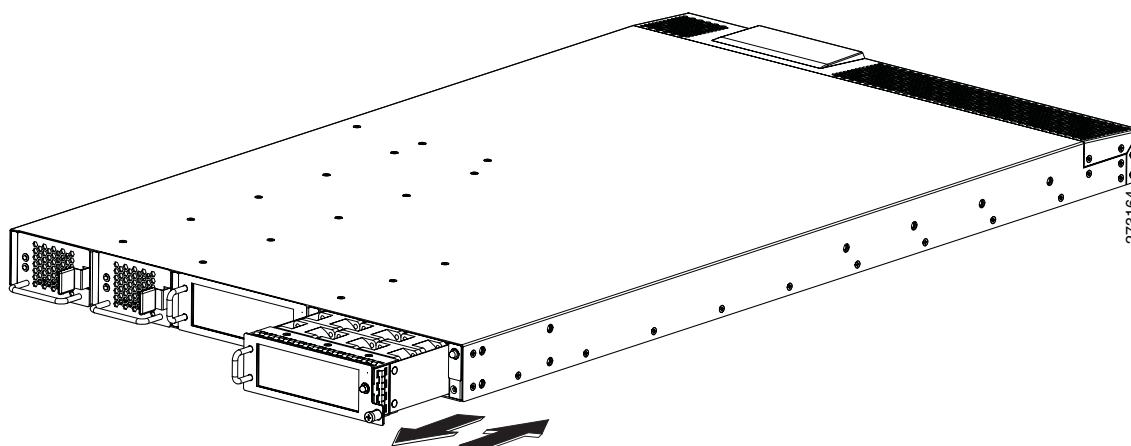


Figure 2-14 shows a fan module partially installed in the Cisco Nexus 5010 switch.

Figure 2-14 Fan Module for the Cisco Nexus 5010 switch



Removing a Fan Module



Warning

When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray. Statement 258

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To remove a fan module, follow these steps:

-
- Step 1** Loosen the captive screws on the fan module by turning them counterclockwise, using a flat-blade or number 2 Phillips screwdriver if required.
 - Step 2** Grasp the handle of fan module and pull it outward.
 - Step 3** Pull the fan module clear of the chassis.
-

Installing a Fan Module

To install a fan module, follow these steps:

-
- Step 1** Hold the fan module with the LED at the bottom.
 - Step 2** Place the fan module into the front chassis cavity so it rests on the chassis, and then push the fan module into the chassis as far as it can go and the captive screw makes contact with the chassis, and tighten the captive screw.
 - Step 3** Listen for the fans if the switch is powered on. You should immediately hear them operating. If you do not hear them, ensure that the fan module is inserted completely in the chassis and the faceplate is flush with the outside surface of the chassis.
 - Step 4** Verify that the LED is green. If the LED is not green, one or more fans are faulty. If this occurs, contact your customer service representative for a replacement part.



Note

If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco, contact Cisco Technical Support at this URL: <http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>.

Removing the Cisco Nexus 5000 Switch



Caution

The slider rail and front rack-mount brackets do not have a stop mechanism when sliding in and out. If the front of the chassis is unfastened from the rack and the chassis slides forward on the slider rails, it may slip off the end of the rails and fall out of the rack.

To remove the Cisco Nexus 5000 switch from a rack, follow these steps:

-
- Step 1** Ensure that the weight of the Cisco Nexus 5000 switch is fully supported and that the switch is being held by another person.
 - Step 2** Disconnect the power cord and the console cables.
 - Step 3** Disconnect all cables that are connected to SFP+ transceivers.
 - Step 4** Remove the screws fastening the front rack-mount brackets to the mounting rails.

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Step 5 Gently slide the Cisco Nexus 5000 switch towards you, off of the slider rails and out of the rack.

Repacking the Cisco Nexus 5000 Switch for Return Shipment

If you need to return the Cisco Nexus 5000 switch, remove the switch from the rack by following the steps in “[Removing the Cisco Nexus 5000 Switch](#)” section on page 2-25, and repack it for shipment. If possible, use the original packing materials and container to repack the switch. Contact your Cisco customer service representative to arrange for return shipment to Cisco.



CHAPTER 3

Connecting the Cisco Nexus 5000 Switch

The Cisco Nexus 5000 switch provides the following types of ports:

- Console port —An RS-232 port that you can use to create a local management connection.
- Ethernet ports, both encrypted and unencrypted—These ports can be used to connect to a LAN.
- Fibre Channel ports—These ports can be used to connect to a SAN.



Caution

When running power and data cables in overhead or subfloor cable trays, Cisco Systems strongly recommends that power cables and other potential noise sources must be located as far away as practical from network cabling that terminates on Cisco Systems equipment. In situations where long parallel cable runs cannot be separated by at least 3.3 ft (1 m), Cisco Systems recommends shielding any potential noise sources by housing them in a grounded metallic conduit.

This chapter includes the following topics:

- [Preparing for Network Connections, page 3-2](#)
- [Connecting to the Console Port, page 3-2](#)
- [Connecting to the Ethernet Connector Port, page 3-3](#)
- [Connecting to an Ethernet Port, page 3-4](#)
- [Connecting to a Fibre Channel Port, page 3-7](#)

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Preparing for Network Connections

When preparing your site for network connections to the Cisco Nexus 5000 switch, consider the following for each type of interface, and gather all the required equipment before connecting the ports:

- Cabling required for each interface type
- Distance limitations for each signal type
- Additional interface equipment required

Connecting to the Console Port

The console port is an RS-232 port with an RJ-45 interface. (See [Figure 3-1](#).) The console port is an asynchronous (async) serial port; any device connected to this port must be capable of asynchronous transmission.

We recommend using this port to create a local management connection to set the IP address and other initial configuration settings before connecting the switch to the network for the first time.

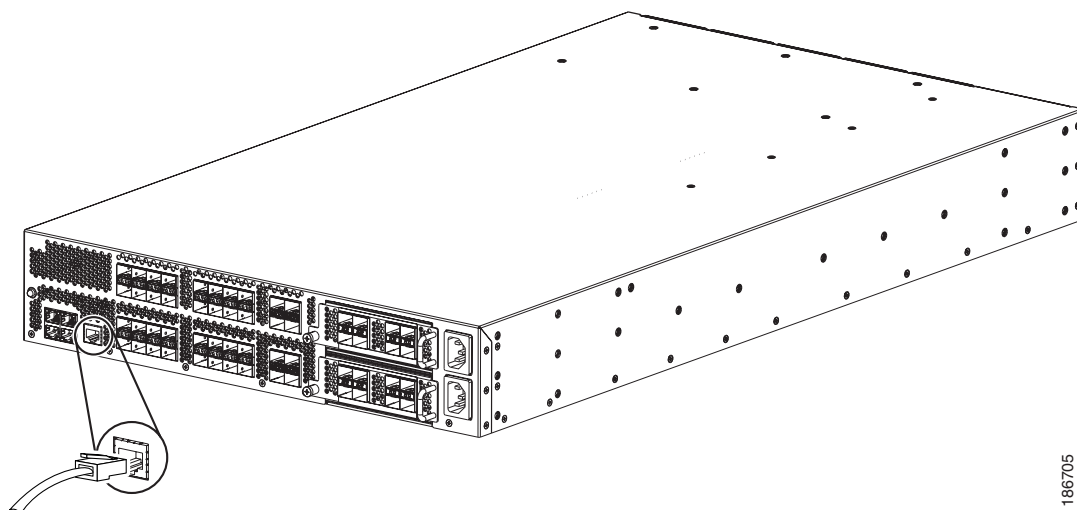


Caution

The console port can be used to connect to a modem. If you do not connect it to a modem, connect it either before powering the switch on or after the switch has completed the boot process.

[Figure 3-1](#) shows how to connect to the console port on the Cisco Nexus 5020 switch. The process is identical for the Cisco Nexus 5010 switch.

Figure 3-1 Connecting to the Console Port on a Cisco Nexus 5000 Switch



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You can use the console port to perform the following:

- Configure the Cisco Nexus 5000 switch from the CLI.
- Monitor network statistics and errors.
- Configure SNMP agent parameters.
- Download software updates.

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You can use the console port to perform the following:

- Configure the Cisco Nexus 5010 switch from the CLI.
- Monitor network statistics and errors.
- Configure SNMP agent parameters.
- Download software updates.

**Note**

To connect the console port to a computer terminal, the computer must support VT100 terminal emulation. The terminal emulation software (frequently an application such as HyperTerminal or Procomm Plus) makes communication between the Cisco Nexus 5000 switch and a computer possible during setup and configuration.

To connect the console port to a computer terminal, follow these steps:

- Step 1** Configure the terminal emulator program to match the following default port characteristics: 9600 baud, 8 data bits, 1 stop bit, no parity.
- Step 2** Connect the RJ-45 connector of the console cable to the console port (see [Figure 3-1](#)) and the DB-9 connector to the computer serial port.

**Note**

For configuration instructions, see the *Cisco Nexus 5000 Series CLI Configuration Guide*.

Connecting to the Ethernet Connector Port

**Caution**

To prevent an IP address conflict, do not connect the management port to the network until the initial configuration is complete. For configuration instructions, see the *Cisco Nexus 5000 Series Switch Configuration Guide*.

The Ethernet connector port has an RJ-45 interface.

To connect the Ethernet connector port to an external hub, switch, or router, follow these steps:

- Step 1** Connect the appropriate modular cable to the Ethernet connector port:
- Use modular, RJ-45, straight-through UTP cables to connect the Ethernet connector port to an Ethernet switch port or hub.
 - Use a cross-over cable to connect to a router interface.
- Step 2** Connect the other end of the cable to the device.

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Connecting to an Ethernet Port

Use an SFP+ transceiver to connect to an Ethernet port, as described in this section.

Removing and Installing SFP+ Transceivers

**Caution**

Excessively removing and installing an SFP transceiver can shorten its life. Do not remove and insert SFP transceivers more often unless it is absolutely necessary. We recommend disconnecting cables before installing or removing SFP transceivers to prevent damage to the cable or transceiver.

This section describes the proper method for installing and removing an SFP+ transceiver.

Installing an SFP+ Transceiver

To install an SFP+ transceiver, follow these steps:

-
- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
 - Step 2** Remove the dust cover from the port cage.
 - Step 3** Remove the dust cover from the port end of the transceiver.
 - Step 4** Insert the transceiver into the port:
 - If the transceiver has a Mylar tab, position the transceiver with the tab on the bottom, and then gently insert the transceiver into the port until it clicks into place.
 - If the transceiver has a bale clasp, position the transceiver with the clasp on the bottom, close the clasp by pushing it up over the transceiver, and then gently insert the transceiver into the port until it clicks into place.

**Caution**

If the transceiver does not install easily, ensure that it is correctly positioned and the tab or clasp are in the correct position before continuing.

**Note**

If you cannot install the cable into the transceiver, insert or leave the dust plug in the cable end of the transceiver.

Removing an SFP+ Transceiver

To remove an SFP+ transceiver, follow these steps:

-
- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
 - Step 2** If a cable is installed in the transceiver:
 - a. Record the cable and port connections for later reference.

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- b. Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
- c. Insert a dust plug into the cable end of the transceiver.

**Caution**

If the transceiver does not remove easily in the next step, push the transceiver completely in and then ensure that the latch is in the correct position before continuing.

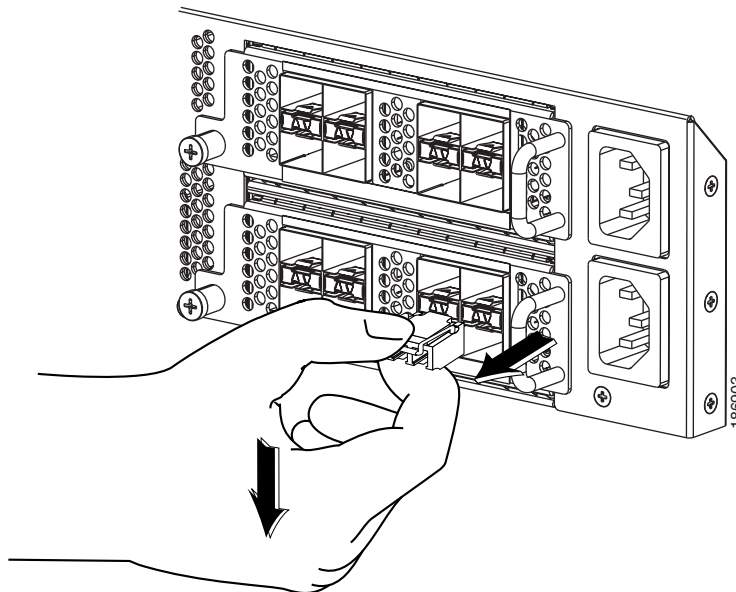
Step 3 Remove the transceiver from the port:

- If the transceiver has a Mylar tab latch, gently pull the tab straight out (do not twist), and then pull the transceiver out of the port.
- If the transceiver has a bale clasp latch, open the clasp by pressing it downwards, and then pull the transceiver out of the port.

**Note**

If you have difficulty removing a bale clasp SFP+ transceiver, you should reseat it by returning the bale clasp to the up position. Press the SFP+ transceiver inward and upward into the cage. Next, lower the bale clasp and pull the SFP+ transceiver straight out with a slight upward lifting force (see [Figure 3-2](#)). Be careful not to damage the port cage during this process.

Figure 3-2 Alternate Removal Method for Bale Clasp SFP+ Transceivers



Step 4 Insert a dust cover into the port end of the transceiver and place the transceiver on an antistatic mat or into a static shielding bag if you plan to return it to the factory.

Step 5 If another transceiver is not being installed, protect the optical cage by inserting a clean cover.

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Removing and Installing Cables into SFP+ Transceivers

**Caution**

To prevent damage to the copper cables, do not place more tension on them than the rated limit and do not bend to a radius of less than 1 inch if there is no tension in the cable, or 2 inches if there is tension in the cable.

Installing a Cable into an SFP+ Transceiver

**Caution**

To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

To install a cable into a transceiver, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** Remove the dust cover from the connector on the cable.
- Step 3** Remove the dust cover from the cable end of the transceiver.
- Step 4** Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place.

**Caution**

If the cable does not install easily, ensure that it is correctly positioned before continuing.

For instructions on verifying connectivity, see the *Cisco Nexus 5000 Switch Configuration Guide*.

Removing a Cable from an SFP+ Transceiver

**Caution**

When pulling a cable from a transceiver, grip the body of the connector. Do not pull on the jacket sleeve, because this action can compromise the fiber-optic termination in the connector.

**Caution**

If the cable does not remove easily, ensure that any latch present on the cable has been released before continuing.

To remove the cable, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
- Step 3** Insert a dust plug into the cable end of the transceiver.

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Step 4 Insert a dust plug onto the end of the cable.

Maintaining SFP+ Transceivers and Cables

SFP+ transceivers must be kept clean and dust-free to maintain high signal accuracy and prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be below 0.35 dB.

Consider the following maintenance guidelines:

- SFP+ transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventive wrist strap that is connected to the chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. If they become dusty, clean before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch ends of connectors to prevent fingerprints and other contamination.
- Clean regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedure.
- Inspect routinely for dust and damage. If damage is suspected, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

Connecting to a Fibre Channel Port

Use an SFP transceiver to connect to an Fibre Channel port.

Removing and Installing SFP Transceivers



Caution

Excessively removing and installing an SFP transceiver can shorten its life. Do not remove and insert SFP transceivers more often unless it is absolutely necessary. Cisco recommends disconnecting cables before installing or removing SFP transceivers to prevent damage to the cable or transceiver.

This section describes the proper method for installing and removing an SFP transceiver.

Installing an SFP Transceiver

To install an SFP transceiver, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

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- Step 2** Remove the dust cover from the port cage.
- Step 3** Remove the dust cover from the port end of the transceiver.
- Step 4** Insert the transceiver into the port:
- If the transceiver has a Mylar tab, position the transceiver with the tab on the bottom, and then gently insert the transceiver into the port until it clicks into place.
 - If the transceiver has a bale clasp, position the transceiver with the clasp on the bottom, close the clasp by pushing it up over the transceiver, and then gently insert the transceiver into the port until it clicks into place.

**Caution**

If the transceiver does not install easily, ensure that it is correctly positioned and the tab or clasp are in the correct position before continuing.

**Note**

If you cannot install the cable into the transceiver, insert or leave the dust plug in the cable end of the transceiver.

Removing an SFP Transceiver

To remove an SFP transceiver, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** If a cable is installed in the transceiver:
- a. Record the cable and port connections for later reference.
 - b. Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
 - c. Insert a dust plug into the cable end of the transceiver.

**Caution**

If the transceiver does not remove easily in the next step, push the transceiver completely in and then ensure that the latch is in the correct position before continuing.

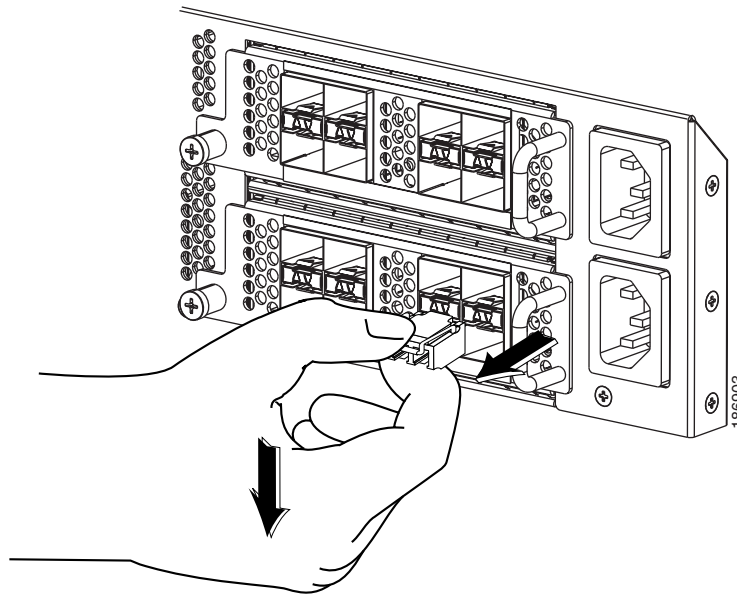
- Step 3** Remove the transceiver from the port:
- If the transceiver has a Mylar tab latch, gently pull the tab straight out (do not twist), and then pull the transceiver out of the port.
 - If the transceiver has a bale clasp latch, open the clasp by pressing it downwards, and then pull the transceiver out of the port.

**Note**

If you have difficulty removing a bale clasp SFP transceiver, you should reseat the SFP by returning the bale clasp to the up position. Press the SFP inward and upward into the cage. Next, lower the bale clasp and pull the SFP straight out with a slight upward lifting force (see [Figure 3-3](#)). Be careful not to damage the port cage during this process.

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Figure 3-3 Alternate Removal Method for Bale Clasp SFP Transceivers



- Step 4** Insert a dust cover into the port end of the transceiver and place the transceiver on an antistatic mat or into a static-shielding bag if you plan to return it to the factory.
- Step 5** If another transceiver is not being installed, protect the optical cage by inserting a clean cover.

Removing and Installing Cables into SFP Transceivers



Caution

To prevent damage to the fiber-optic cables, do not place more tension on them than the rated limit and do not bend to a radius of less than 1 inch if there is no tension in the cable, or 2 inches if there is tension in the cable.

Installing a Cable into an SFP Transceiver



Caution

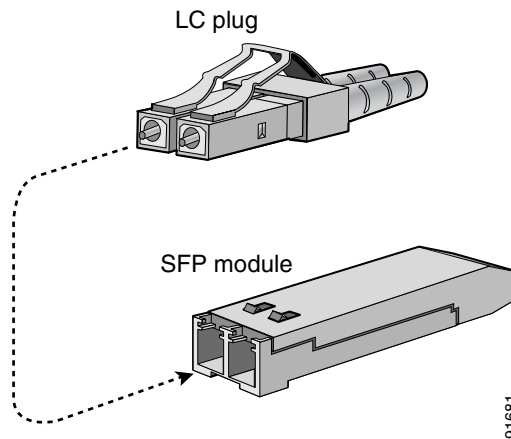
To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

To install a cable into a transceiver, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** Remove the dust cover from the connector on the cable.
- Step 3** Remove the dust cover from the cable end of the transceiver.
- Step 4** Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place. (See [Figure 3-4](#)).

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Figure 3-4 Connecting the LC-Type Cable to a Fibre Channel Port



Caution If the cable does not install easily, ensure that it is correctly positioned before continuing.

For instructions on verifying connectivity, see the *Cisco Nexus 5000 Series CLI Configuration Guide*.

Removing a Cable from an SFP Transceiver



Caution

When pulling a cable from a transceiver, grip the body of the connector. Do not pull on the jacket sleeve, because this action can compromise the fiber-optic termination in the connector.



Caution

If the cable does not remove easily, ensure that any latch present on the cable has been released before continuing.

To remove the cable, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap and follow its instructions for use.
- Step 2** Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
- Step 3** Insert a dust plug into the cable end of the transceiver.
- Step 4** Insert a dust plug onto the end of the cable.

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Maintaining SFP Transceivers and Fiber-Optic Cables

SFP transceivers and fiber-optic cables must be kept clean and dust-free to maintain high signal accuracy and prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be below 0.35 dB.

Consider the following maintenance guidelines:

- SFP transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventive wrist strap that is connected to the chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. If they become dusty, clean before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch ends of connectors to prevent fingerprints and other contamination.
- Clean regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedure.
- Inspect routinely for dust and damage. If damage is suspected, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

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APPENDIX **A**

Cabinet and Rack Installation

This appendix provides the requirements for cabinet and rack installation and includes the following sections:

- [Cabinet and Rack Requirements, page A-1.](#)
- [Cable Management Guidelines, page A-3](#)

Cabinet and Rack Requirements

This section provides the requirements for the following types of cabinets and racks, assuming an external ambient air temperature range of 0 to 104°F (0 to 40°C):

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom to top cooling)
- Standard open racks



Note

If you are selecting an enclosed cabinet, we recommend one of the thermally validated types: standard perforated or solid-walled with a fan tray.



Note

Do not use racks that have obstructions (such as power strips), because the obstructions could impair access to field-replaceable units (FRUs).

General Requirements for Cabinets and Racks

The cabinet or rack must be one of the following types:

- Standard 19-in. (48.3 cm) (four-post EIA cabinet or rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992. See the [“Requirements Specific to Perforated Cabinets”](#) section on page A-2 and the [“Requirements Specific to Solid-Walled Cabinets”](#) section on page A-3.

The cabinet or rack must also meet the following requirements:

- The minimum vertical rack space per 5020 chassis must be two RU (rack units), equal to 3.50 inches (8.9 cm).

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- The minimum vertical rack space per 5010 chassis must be one RU (rack unit), equal to 1.75 inches (4.4 cm).
- The width between the rack-mounting rails must be at least 17.75 inches (45.1 cm) if the rear of the switch is not attached to the rack. For four-post EIA racks, this is the distance between the two front rails.
- For four-post EIA cabinets (perforated or solid-walled):
 - The minimum spacing for the bend radius for fiber-optic cables should have the front-mounting rails of the cabinet offset from the front door by a minimum of 3 inches (7.6 cm), and a minimum of 5 inches (12.7 cm) if cable management brackets are installed on the front of the chassis.
 - The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.5 to 34.0 inches (59.7 to 86.4 cm) to allow for rear-bracket installation.
 - A minimum of 2.5 inches (6.4 cm) of clear space should exist between the side edge of the chassis and the side wall of the cabinet. No sizeable flow obstructions should be immediately in the way of chassis air intake or exhaust vents.

**Note**

Optional jumper power cords are available for use in a cabinet. See the [“Jumper Power Cord” section on page C-10](#).

Requirements Specific to Perforated Cabinets

A perforated cabinet is defined here as a cabinet with perforated front and rear doors and solid side walls. In addition to the requirements listed in the [“General Requirements for Cabinets and Racks” section on page A-1](#), perforated cabinets must meet the following requirements:

- The front and rear doors must have at least a 60 percent open area perforation pattern, with at least 15 square inches of open area per rack unit of door height.
- The roof should be perforated with at least a 20 percent open area.
- The cabinet floor should be open or perforated to enhance cooling.

A perforated cabinet that conforms to these requirements is available from Rittal Corporation:

Rittal Corporation

One Rittal Place

Springfield, OH 45504

Contact: (800) 477-4220

Cabinet P/N: Rittal 9969427

Cabinet description: PS-DK/OEM Cabinet Assembly, (78.7 in.) 1998 mm X 23.6 in. (600 mm) X 39.4 in. (1000 mm) (H x W x D) (42 RU)

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Requirements Specific to Solid-Walled Cabinets

A solid-walled cabinet is defined here as a cabinet with solid front and rear doors and solid side walls. In addition to the requirements listed in the [“General Requirements for Cabinets and Racks”](#) section on [page A-1](#), solid-walled cabinets must meet the following requirements:

- A roof-mounted fan tray and an air cooling scheme in which the fan tray pulls air in at the bottom of the cabinet and exhausts it out the top, with a minimum of 500 cubic feet per minute of airflow exiting the cabinet roof through the fan tray.
- Nonperforated (solid and sealed) front and back doors and side panels so that air travels predictably from bottom to top.
- A recommended cabinet depth of 36 to 42 inches (91.4 to 106.7 cm) to allow the doors to close and for adequate airflow.
- A minimum of 150 sq. inches (968 sq. cm) of open area at the floor air intake of the cabinet.
- The lowest piece of equipment should be installed a minimum of 1.75 inches (4.4 cm) above the floor openings to prevent blocking the floor intake.

Requirements Specific to Standard Open Racks

In addition to the requirements listed in the [“General Requirements for Cabinets and Racks”](#) section on [page A-1](#), if mounting the chassis in an open rack (no side panels or doors), ensure that the rack meets the following requirements:

- The minimum vertical rack space per chassis must be two RU (rack unit), equal to 3.47 inches (8.8 cm).
- The horizontal distance between the chassis and any adjacent chassis should be 6 inches (15.2 cm), and the distance between the chassis air vents and any walls should be 2.5 inches (6.4 cm).

Cable Management Guidelines

To help with cable management, you might want to allow additional space in the rack above and below the chassis to make it easier to route as many as 56 fiber or copper cables through the rack.

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APPENDIX **B**

Technical Specifications

This appendix includes the following sections:

- [Switch Specifications, page B-1](#)
- [Expansion Module Specifications, page B-2](#)
- [Power Specifications, page B-2](#)
- [Transceiver Specifications, page B-4](#)



Note

Specifications for cables and connectors are provided in [Appendix C, “Cable and Port Specifications.”](#)

Switch Specifications

[Table B-1](#) lists the physical specifications for the Cisco Nexus 5020 switch.

Table B-1 *Physical Specification for the Cisco Nexus 5020 Switch*

Description	Specification
Dimensions (H x W x D)	3.47 in (8.8 cm) x 17.3 in (43.9 cm) x 30.0 in (76.2 cm)
Weight (with two power supplies and two expansion modules installed)	50 lb (22.680 kg)

[Table B-2](#) lists the physical specifications for the Cisco Nexus 5010 switch.

Table B-2 *Physical Specification for the Cisco Nexus 5010 Switch*

Description	Specification
Dimensions (H x W x D)	1.72 in x 17.3 in (43.9 cm) x 30.0 in (76.2 cm)
Weight (with two power supplies and one expansion module installed)	35 lb (15.875 kg)

[Table B-3](#) lists the environmental specifications for the Cisco Nexus 5000 switch.

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Table B-3 *Environmental Specifications for the Cisco Nexus 5020 Switch*

Description	Specification
Temperature, operating	32 to 104°F (0 to 40°C)
Temperature, nonoperating	-40 to 158°F (-40 to 70°C)
Humidity (RH), noncondensing	5 to 95%
Altitude	0 to 10000 ft (0 to 3000 m)

Expansion Module Specifications

Table B-4 *Physical Specifications for the Cisco Nexus 5020 Switch Expansion Modules*

Description	Specification
Weight	1 lb (0.5 kg)

Power Specifications

This section includes the following topics:

- [Specifications for the Cisco Nexus 5020 Power Supply, page B-2](#)
- [Specifications for the Cisco Nexus 5010 Power Supply, page B-3](#)
- [Power Supply LED Indicators, page B-3](#)

Specifications for the Cisco Nexus 5020 Power Supply

[Table B-5](#) lists the specifications for the Cisco Nexus 5020 power supply.

Table B-5 *Specifications for the Cisco Nexus 5020 Power Supply*

Description	Specification
AC-input voltage (VinHigh)	Minimum = 90 Vrms Rated = 100 to 240 Vrms Maximum = 264 Vrms
AC-input frequency (VinFrequency)	Minimum = 47 Hz Rated = 50 to 60 Hz Maximum = 63 Hz
Maximum power	750 W
Typical power	480 W
Power supply output voltage	12 V
Dimensions (H x W x D)	1.57 in (0.039m) x 4.00 in (0.101m) x 13.00 in (.330m)

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The current power supply in the Nexus 5020 has a label for 200-240V. However, it has since been certified to support 110V input as well. As a result, both 110V and 220V inputs are supported and the labels on the chassis moving forwards will reflect this capability. A new software release will be required to support this capability.

Specifications for the Cisco Nexus 5010 Power Supply

The power supplies connect to the system through panel mount connectors and connectors attach to the baseboard through cables. There are total of 3 connectors on the baseboard, two for power delivery, and one for power supply control signals. [Table B-6](#) lists the specifications for the Cisco Nexus 5010 power supply.

Table B-6 **Specifications for the Cisco Nexus 5010 Power Supply**

Description	Specification
Rated power	550W
Input voltage	90-264 VAC
Frequency	47-63Hz
PSU Control Interface	I2C
ROHS Compliant	Yes
Size (W x H x D)	2.75 x 1.57 x 13.7 (in)
Cubic Inches	59
Power Density	9.3 W / in ³
Operating Temperature	0 °C to 50 °C
Cooling	Internal fans to cool the supply
Input connector	AC connector in the chassis
Output connector	DC output connector in the back
Hot plug capable	Yes
Supply Indicators	Supply Health: Green indicates supply is good and Amber indicates a fault. AC good indicator: Green indicating AC is present and is within the supply spec

Power Supply LED Indicators

[Table B-7](#) lists the LED indicators for the LED on the front of the power supply.

Table B-7 **Power Supply LED Indicators**

Condition	Power LED Status (Green)	Fail LED Status (Amber)
No AC power to the power supplies	Off	Off
Power supply failure (includes over voltage, over current, over temperature, and fan failure)	Off	On

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Table B-7 **Power Supply LED Indicators**

Condition	Power LED Status (Green)	Fail LED Status (Amber)
Power supply warning events where the power supply continues to operate (high temperature, high power, and slow fan)	Off	1 Hz blinking
AC present / 3.3 voltage standby (VSB) on, and power supply unit off	1 Hz blinking	Off
Power supply On and OK	On	Off

Transceiver Specifications

Table B-8 lists general specifications for the 10-Gigabit Ethernet SFP+ transceiver module.

Table B-8 **General Specifications for the 10-Gigabit Ethernet SFP+ Transceiver Module**

Description	Short Range	
Connector type	LC	
Wavelength	850 nm	
Core size	50 microns	62.5 microns
Cable distance	300 m	33 m

Environmental Conditions and Power Requirement Specifications for SFP+ Transceivers

Table B-9 lists the environmental conditions and power requirement specifications for the 10-Gigabit Ethernet SFP+ transceiver module.

Table B-9 **Environmental Conditions and Power Requirement Specifications for the 10-Gigabit Ethernet SFP+ Transceiver Module**

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	T _S	-40		°C
Case temperature	T _C	0	70	°C
Relative humidity	RH			
Module supply voltage	V _{CC} T,R	3.1	3.5	V

General Specifications for Cisco Fibre Channel SFP Transceivers

Table B-10 lists the general specifications for Cisco Fibre Channel SFP transceivers at 4 Gbps.

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Table B-10 General Specifications for Cisco Fibre Channel SFP Transceivers at 4 Gbps

Description	Short Wavelength	
Connector type	LC	
Wavelength	850 nm	
Fibre type	MMF	
Core size	50 microns	62.5 microns
Cable distance ¹	328.08 yd (300 m)	164.04 yd (150 m)
Transmit power	-9 to -2.5 dBm	

1. Approximate; actual distance may vary depending on fiber quality and other factors.

Environmental Conditions and Power Requirements Specification for SFP Transceivers

Table B-11 provides the maximum environmental and electrical ratings for Cisco Fibre Channel SFP transceivers.

Table B-11 Environmental Conditions and Power Requirements Specifications for SFP Transceivers

Parameter	Symbol	Min.	Max.	Unit
Storage temperature ¹	T _S	-40	85	°C
Case temperature ^{1, 2}	T _C	0	70	°C
Relative humidity ¹	RH	5	95	%
Module supply voltage ¹	V _{CC} T,R	3.1	3.5	V

1. Absolute maximum ratings are those values beyond which damage to the device may occur if these limits are exceeded for other than a short period of time.
2. Functional performance is not intended, device reliability is not implied, and damage to the device may occur over an extended period of time between absolute maximum ratings and the recommended operating conditions.

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APPENDIX **C**

Cable and Port Specifications

This appendix provides cable and port specifications, and includes the following sections:

- [Accessory Kit for the Cisco Nexus 5020 Switch, page C-1](#)
- [Accessory Kit for the Cisco Nexus 5010 Switch, page C-1](#)
- [Console Port, page C-3](#)
- [Supported Power Cords and Plugs, page C-4](#)
- [Jumper Power Cord, page C-10](#)

Accessory Kit for the Cisco Nexus 5020 Switch

The Cisco Nexus 5020 switch accessory kit includes the following items:

- 2 slider rails
- 2 rack-mount guides
- 2 rack-mount brackets
- 16 M4 x 0.7 x 8-mm Phillips countersunk screws
- 12 10-32 rack nuts
- 12 10-32 x 3/4-inch Phillips countersunk screws
- 1 console cable with an RJ-45-RS-232 adapter and a DB9 adapter
- 1 ground lug kit
- 1 ESD wrist strap



Note

Additional parts can be ordered from your customer service representative.

Accessory Kit for the Cisco Nexus 5010 Switch

The Cisco Nexus 5010 switch accessory kit includes the following items:

- 2 slider rails
- 2 rack-mount guides
- 2 rack-mount brackets

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- 12 M4 x 0.7 x 8-mm Phillips countersunk screws
- 10 10-32 rack nuts
- 10 10-32 x 3/4-inch Phillips countersunk screws
- 1 console cable with an RJ-45-RS-232 adapter and a DB9 adapter
- 1 ground lug kit
- 1 ESD wrist strap



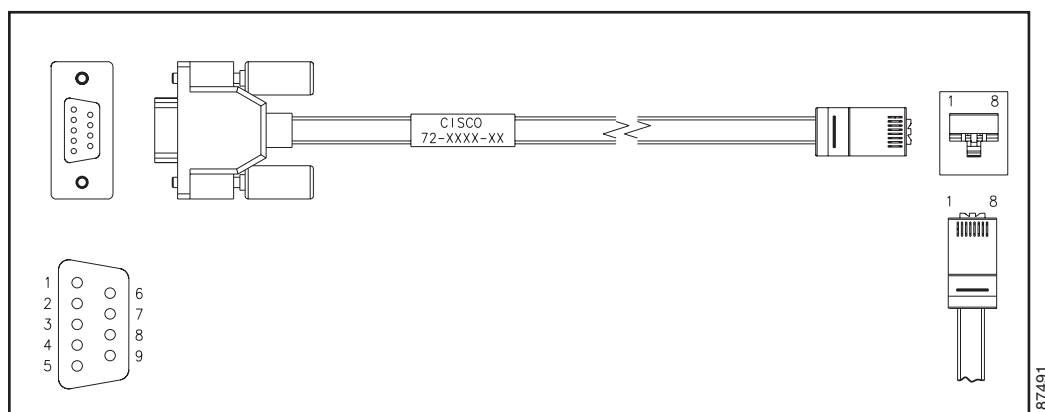
Note

Additional parts can be ordered from your customer service representative.

Console Cable

The console cable has a RJ-45, RS-232 connector on one end and a DB9 connector on the other end. See [Figure C-1](#).

Figure C-1 Console Cable



Cable RJ-45 Connector Pinouts

[Table C-1](#) lists the pinouts for the RJ-45 connector on the console cable.

Table C-1 Cable Connector Pinouts

Signal Name	P1, P1-45 Pins	P2, DB-9 Pins	Signal Name
RTS	1	8	CTS
DTR	2	6	DSR
TXD	3	2	ZXD
GND	4	5	GND
GND	5	5	GND
ZXD	6	3	TXD

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Table C-1 *Cable Connector Pinouts*

Signal Name	P1, P1-45 Pins	P2, DB-9 Pins	Signal Name
DSR	7	4	DTR
CTS	8	7	RTS

Console Port

The console port is an asynchronous RS-232 serial port with an RJ-45 connector.

Console Port Pinouts

[Table C-2](#) lists the pinouts for the console port on the Cisco Nexus 5020 switch.

Table C-2 *Console Port Pinouts*

Pin	Signal
1	RTS
2	DTR
3	TxD
4	GND
5	GND
6	RxD
7	DSR
8	CTS

[Table C-3](#) lists the pinouts for the console port on the Cisco Nexus 5010 switch.

Table C-3 *Console Port Pinouts*

Pin	Signal
1	RTS
2	DTR
3	TxD
4	GND
5	GND
6	RxD
7	DSR
8	CTS

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Supported Power Cords and Plugs

Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to a power distribution unit having IEC 60320 C19 outlet receptacles. The jumper power cords, for use in cabinets, are available as an optional alternative to the standard power cords.

Power Cords

The standard power cords have an IEC C19 connector on the end that plugs into the switch. The optional jumper power cords have an IEC C19 connector on the end that plugs into the switch, and an IEC C20 connector on the end that plugs into an IEC C19 outlet receptacle.



Note

Only the regular power cords or jumper power cords provided with the switch are supported.

[Table C-4](#) lists the power cords for the Cisco Nexus 5020 switch and provides their lengths in feet and meters.

Table C-4 Power Cords for the Cisco Nexus 5020 Switch

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
SFS-250V-10A-AR Power Cord, 250 VAC 10 A IRAM 2073 Plug Argentina	8.2	2.5	Figure C-2
CAB-9K10A-AU 250 VAC 10 A 3112 Plug, Australia	8.2	2.5	Figure C-3
SFS-250V-10A-CN Power Cord, 250 VAC 10 A GB 2009 Plug China	8.2	2.5	Figure C-4
CAB-9K10A-EU Power Cord, 250 VAC 10 A M 2511 Plug Europe	8.2	2.5	Figure C-5
SFS-250V-10A-ID Power Cord, 250 VAC 16A EL-208 Plug South Africa, United Arab Emerits, India	8.2	2.5	Figure C-6
SFS-250V-10A-IS Power Cord, 250 VAC 10 A SI32 Plug Israel	8.2	2.5	Figure C-7
CAB-9K10A-IT Power Cord, 250 VAC 10 A CEI 23-16 Plug Italy	8.2	2.5	Figure C-8
CAB-9K10A-SW Power Cord, 250 VAC 10 A MP232 Plug Switzerland	8.2	2.5	Figure C-9

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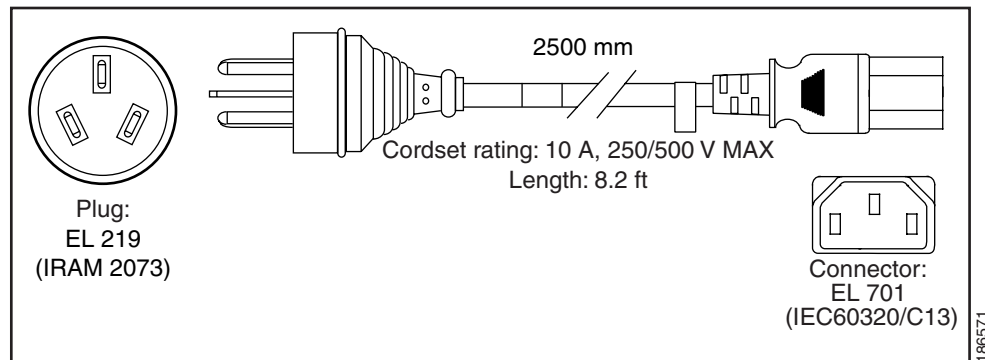
Table C-4 Power Cords for the Cisco Nexus 5020 Switch (continued)

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
CAB-9K10A-UK Power Cord, 250 VAC 10 A BS1363 Plug (13 A fuse) United Kingdom	8.2	2.5	Figure C-10
CAB-AC-250V/13A Power Cord, 250 VAC 13 A IEC60320 Plug North America	6.6	2.0	Figure C-11
CAB-N5K6A-NA Power Cord, 250 VAC 13 A NEMA 6-15 Plug, North America	8.2	2.5	Figure C-12
CAB-C13-C14-JMPR Cabinet Jumper Power Cord, 250 VAC 13 A, C14-C15 Connectors	2.2	0.7	Figure C-16

AC Power Cord Illustrations

This section contains the AC power cord illustrations.

Figure C-2 SFS-250V-10A-AR



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Figure C-3 CAB-9K10A-AU

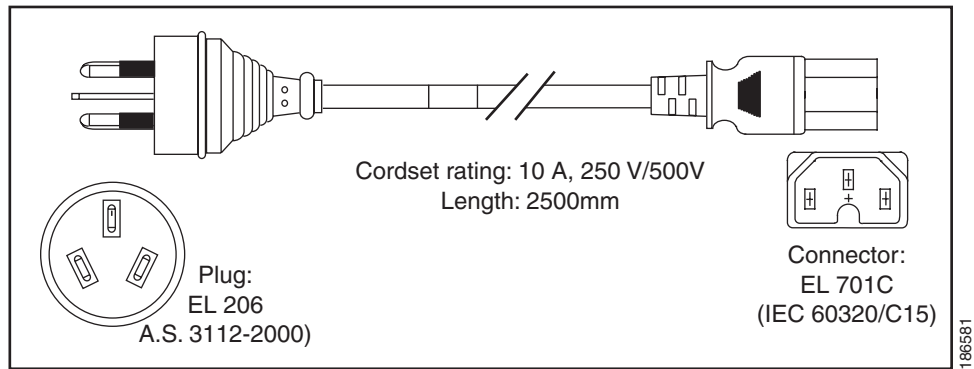


Figure C-4 SFS-250V-10A-CN

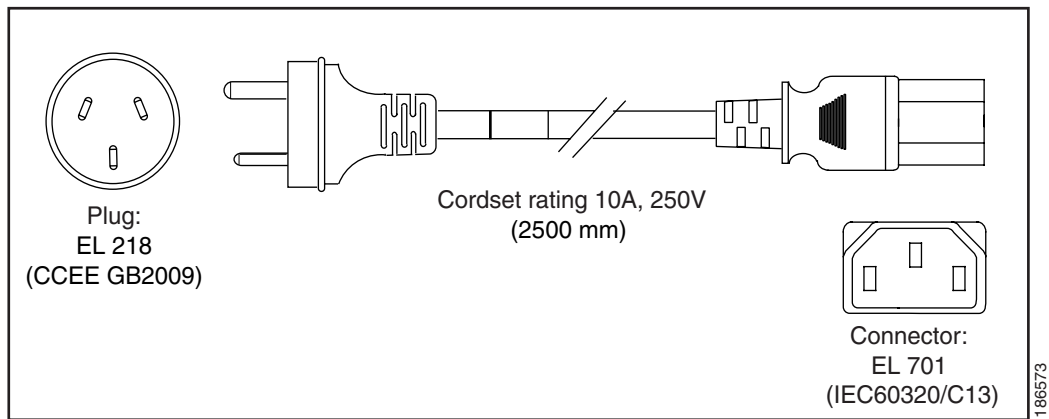
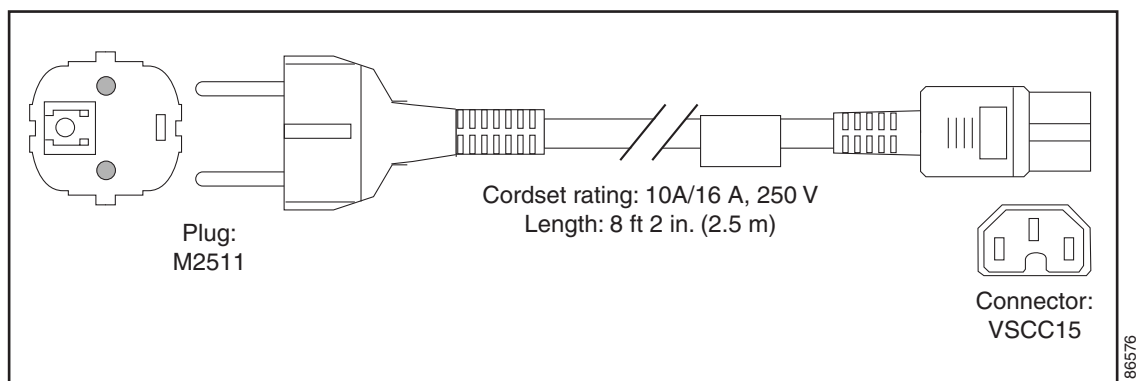
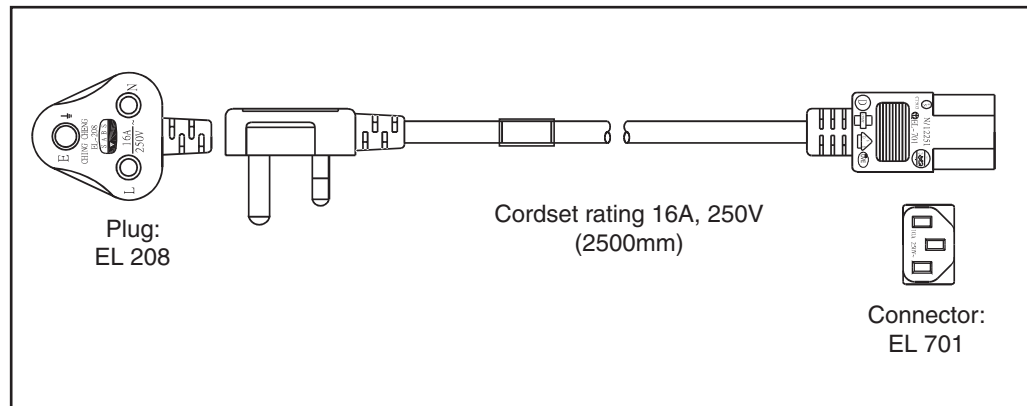


Figure C-5 CAB-9K10A-EU



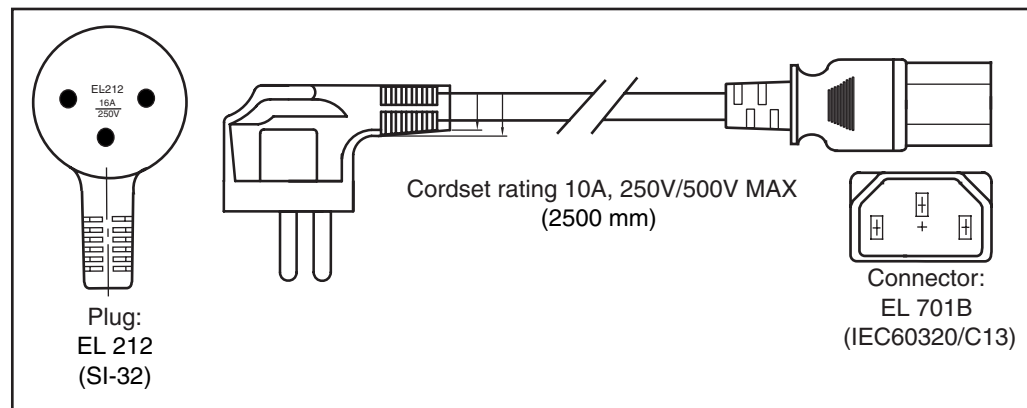
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Figure C-6 SFS-250V-10A-ID



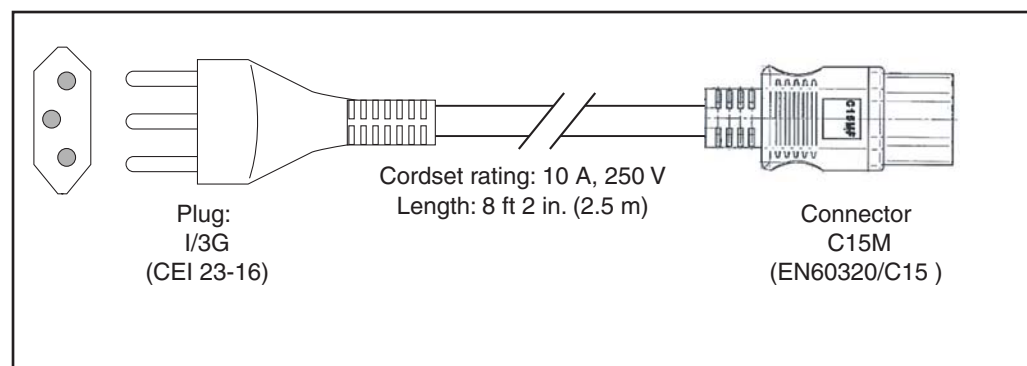
187490

Figure C-7 SFS-250V-10A-IS



186574

Figure C-8 CAB-9K10A-IT



113375

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Figure C-9 CAB-9K10A-SW

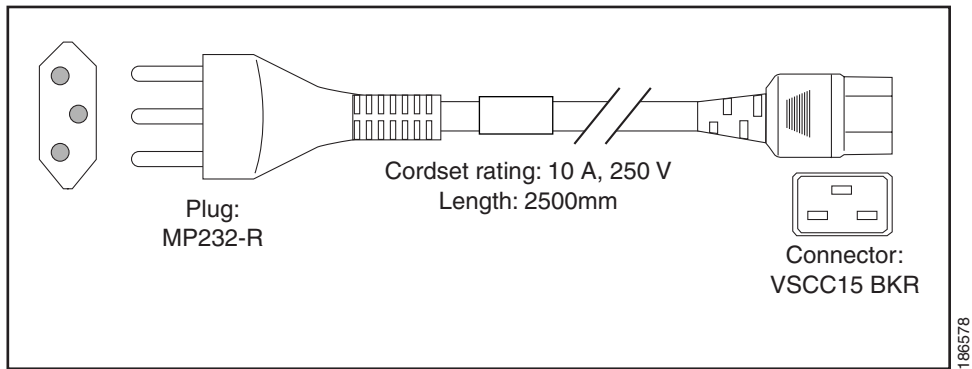


Figure C-10 CAB-9K10A-UK

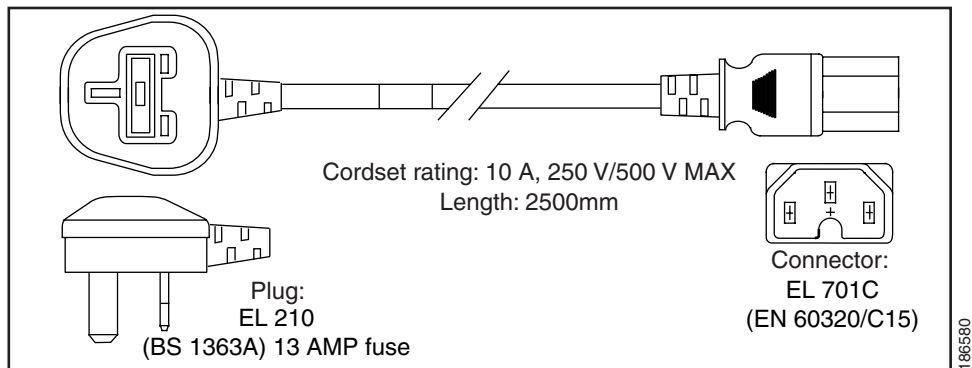


Figure C-11 CAB-AC-250V/13A

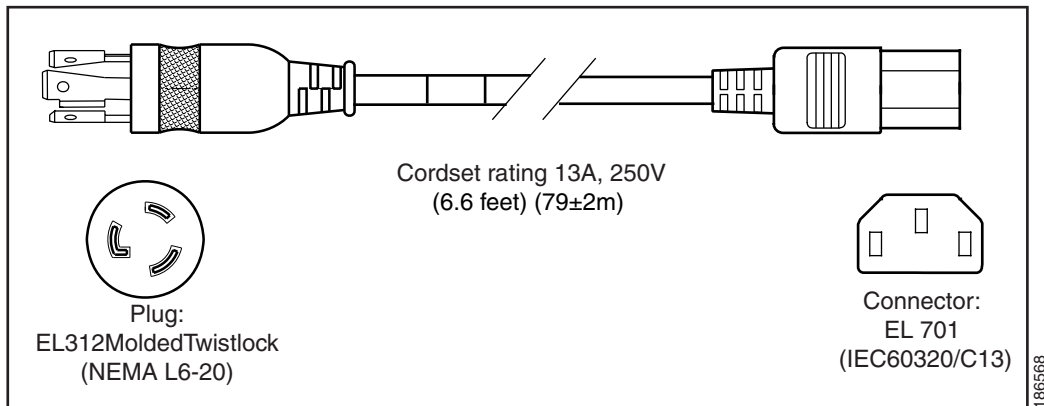


Figure C-12 CAB-N5K6A-NA

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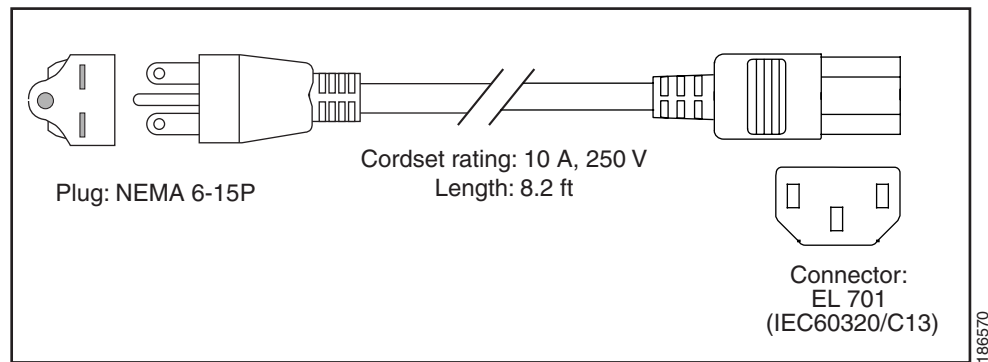


Figure C-13 CAB-9K12A-NA

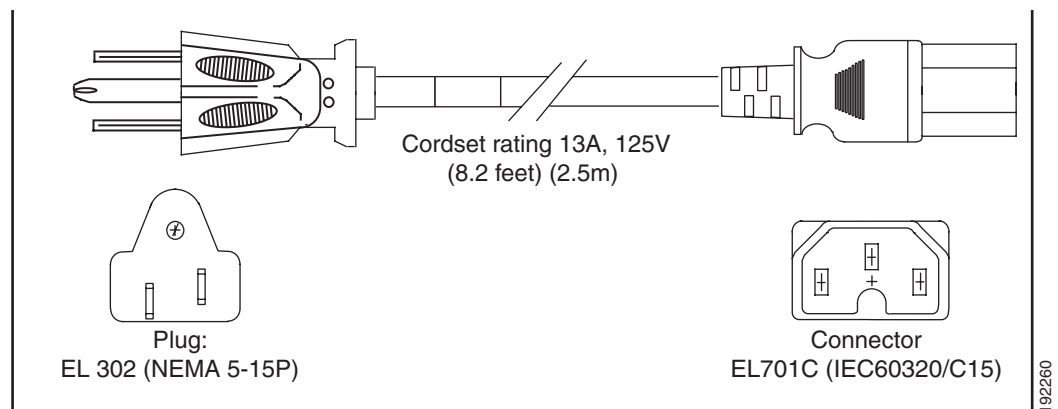


Figure C-14 CAB-C13-CBN

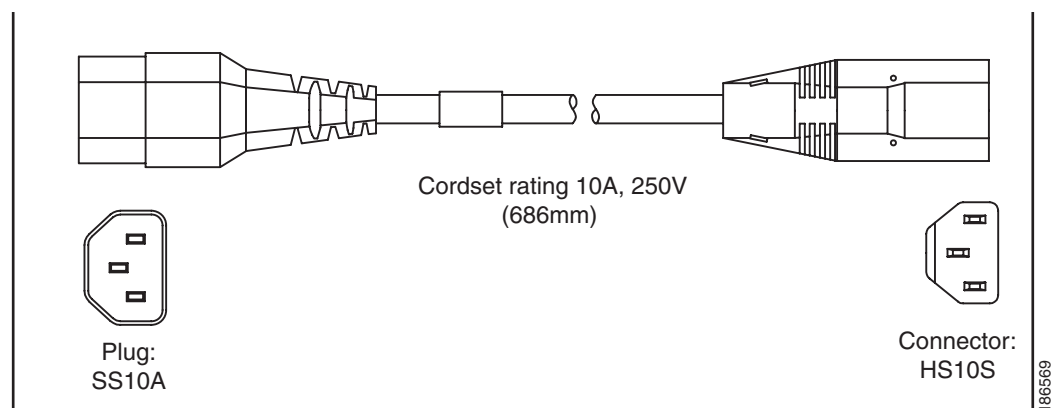
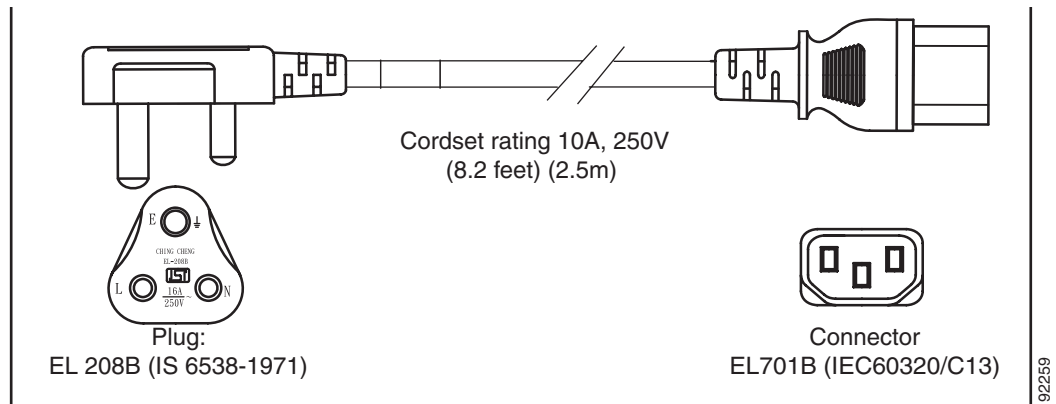


Figure C-15 CAB-IND-10A

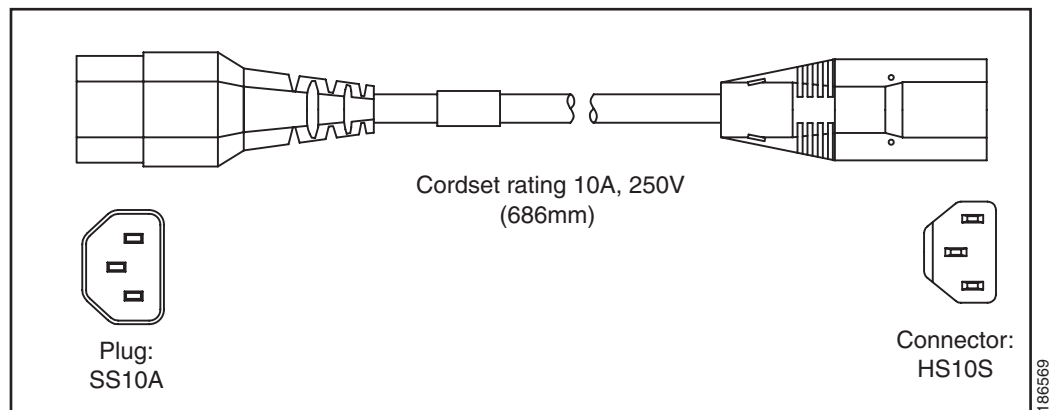
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Jumper Power Cord

Figure C-16 shows the plug connector on the optional jumper power cord for the Cisco Nexus 5020 switch. The plug plugs into the Cisco Nexus 5020 switch power supply, while the connector plugs into the receptacle of a power distribution unit for a cabinet.

Figure C-16 CAB-C13-C14-JMPR, Jumper Power Cord





APPENDIX **D**

Site Planning and Maintenance Records

This appendix includes the following records to use when installing the Cisco Nexus 5000 switch:

- [Site Preparation Checklist, page D-1](#)
- [Contact and Site Information, page D-3](#)
- [Chassis and Module Information, page D-4](#)



Note

For information about how to query the switch for configuration information, see the *Cisco Nexus 5000 Switch Configuration Guide*.

Site Preparation Checklist

Planning the location and layout of your equipment rack or wiring closet is essential for successful switch operation, ventilation, and accessibility. [Table D-1](#) lists the site planning tasks that we recommend completing before installing the Cisco Nexus 5000 switch.

Consider heat dissipation when sizing the air-conditioning requirements for an installation. See [Table B-3 on page B-2](#) for the environmental requirements, and the “[Power Specifications](#)” section on [page B-2](#) for power and heat ratings.

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Table D-1 Site Planning Checklist

Task No.	Planning Activity	Verified By	Time	Date
1	Space evaluation: <ul style="list-style-type: none"> • Space and layout • Floor covering • Impact and vibration • Lighting • Maintenance access 			
2	Environmental evaluation: <ul style="list-style-type: none"> • Ambient temperature • Humidity • Altitude • Atmospheric contamination • Air flow 			
3	Power evaluation: <ul style="list-style-type: none"> • Input power type • Power receptacles¹ • Receptacle proximity to the equipment • Dedicated circuit for power supply • Dedicated (separate) circuits for redundant power supplies • UPS² for power failures 			
4	Grounding evaluation: <ul style="list-style-type: none"> • Circuit breaker size • CO ground (AC- powered systems) 			
5	Cable and interface equipment evaluation: <ul style="list-style-type: none"> • Cable type • Connector type • Cable distance limitations • Interface equipment (transceivers) 			
6	EMI ³ evaluation: <ul style="list-style-type: none"> • Distance limitations for signaling • Site wiring • RFI⁴ levels 			

1. Verify that the power supply installed in the chassis has a dedicated AC source circuit.

2. UPS = uninterruptible power supply.

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3. EMI = electromagnetic interference.
4. RFI = radio frequency interference.

Contact and Site Information

Use the following worksheet ([Table D-2](#)) to record contact and site information.

Table D-2 **Contact and Site Information**

Contact person	
Contact phone	
Contact e-mail	
Building/site name	
Data center location	
Floor location	
Address (line 1)	
Address (line 2)	
City	
State	
Zip code	
Country	

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Chassis and Module Information

Use the following worksheets ([Table D-3](#) and [Table D-4](#)) to record information about the chassis and modules.

Contract Number_____

Chassis Serial Number_____

Product Number_____

Table D-3 Network-Related Information

Switch IP address	
Switch IP netmask	
Host name	
Domain name	
IP broadcast address	
Gateway/router address	
DNS address	
Modem telephone number	

Table D-4 Module Information

Slot	Module Type	Module Serial Number	Notes
1	Supervisor		
2			



Note

The supervisor module and the interface module are not removable.



APPENDIX **E**

Troubleshooting Hardware Components

This appendix describes how to identify and resolve problems that might occur with the hardware components of the Cisco Nexus 5000 switch. It includes the following sections:

- [Overview, page E-1](#)
- [SNMP Traps, page E-1](#)
- [Switch Hardware Best Practices, page E-1](#)

Overview

The key to success when troubleshooting the system hardware is to isolate the problem to a specific system component. The first step is to compare what the system is doing to what it should be doing. Because a startup problem can usually be attributed to a single component, it is more efficient to isolate the problem to a subsystem rather than troubleshoot each separate component in the system.

Problems with the initial power up are often caused by a module that is not firmly connected to the backplane or a power supply that has been disconnected from the power cord connector.

Overheating can also cause problems with the system, though typically only after the system has been operating for an extended period of time. The most common cause of overheating is the failure of a fan module.

SNMP Traps

You can set SNMP traps to monitor fans, power supplies, and temperature settings, or to test a call home application. Use the following commands to set SNMP traps:

- **test pfmtest-SNMP-trap fan**
- **test pfmtest-SNMP-trap power supply**
- **test pfmtest-SNMP-trap temp-sensor**

Switch Hardware Best Practices

Use the recommendations in this section to ensure the proper installation, initialization, and operation of the switch. This section includes the following topics:

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Installation Best Practices

When installing the switch, follow these best practices:

- Plan your site configuration and prepare the site before installing the chassis.
- Verify that you have the appropriate power supplies for your chassis configuration.
- Install the chassis following the rack and airflow guidelines presented in this guide.
- Verify that the chassis is adequately grounded.

Initialization Best Practices

When the initial system boot is complete, verify the following:

- Power supplies are supplying power to the system. See the
- Fan modules are operating normally. See the
- The system software boots successfully. See the *Cisco Nexus 5020 CLI Configuration Guide* for information about booting the system and initial configuration task.

Switch Operation Best Practices

To ensure proper operation of your switch, take the following actions:

- Make a copy of the running configuration to CompactFlash for a safe backup.
- Always enter the **copy running-config startup-config** CLI command after you modify the running configuration and ensure that the system is operating properly.
- Never use the **init system** CLI command unless you understand that you will lose the running and startup configuration as well as the files stored on bootflash:.
- Keep backup copies of the running kickstart and the system images on CompactFlash.



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